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ABSTRACT

The impact of summer vacation on the reading and arithmetic skills of 166 learning disabled pupils (6 to 11 years old) was examined. Ss included pupils in resource programs or special classes. Analysis of scores on the Wide Range Achievement Test (reading and arithmetic subtests) before and after summer vacation revealed significant differences in retention between LD Ss and control Ss (LD Ss retained less). Significant differences were also revealed between LD students in two different placements (special classes and resource specialist programs) and their nonLD peers. However, while the hypotheses were confirmed, the level of acceptance was weak. Implications and recommendations for future study are noted. (CL)

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RETENTION OF SELECTED READING AND ARITHMETIC SKILLS BY LEARNING DISABLED PUPILS AND NON-DISABLED PUPILS OVER SUMMER VACATION

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A thesis submitted to the faculty of
California State College, Stanislaus in
partial fulfillment of the
requirements for the degree
Master of Arts in the School of Education

by

T. VANSTON SHAW

Turlock, California

June, 1982

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Chapter 1

INTRODUCTION

Most public schools in California maintain a 180-day teaching schedule within the months September to June, with the exact length of the school year determined by state law. Local school districts may exceed this limit but may not operate for fewer days during the year.

In addition to the regular year program, many school districts have established summer school programs for pupils. This is an extension of the above noted 180 days of educational programming and is developed to meet better the educational needs of selected pupils.

An issue in educational programming has been to determine the amount of time a pupil needs to spend in school for optimal academic progress. Whether to offer summer school programs or not is part of this issue because of concerns about the retention of academic skills over summer vacation.

While recent research has indicated that regular education pupils' academic achievement scores do not regress over this vacation period (Hoepfner, 1980).[1] There is a paucity of research as to the effects of summer vacation on academic

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[1]Regress and regression refer to a decline in academic test scores or skills and do not refer to a statistical procedure.

skills of special education pupils. There is also reason to be cautious in extrapolating research results from studies involving regular education pupils to the handicapped population who have unique learning problems (Leviton & Kiraly, 1975).

Federal and state legislation and regulations, coupled with recent court decisions, have significantly increased the demand for summer school programs or extended year programs for handicapped pupils (Lenord, 1981; Larsen, 1981). In the summer of 1980, the California Department of Education mandated that all school districts and/or counties within California offer summer school programs to all pupils enrolled in special classes, centers, or other programs when there was the likelihood of "severe regression" over the vacation period and when extended year or summer school instruction was indicated within the pupil's Individual Education Program (I.E.P.) (Duck, 1980).

Traditionally, summer school programs have been offered to the severely handicapped population enrolled in special classes or centers. The summer of 1980 saw an increase in the number of summer school programs in California for "Learning Handicapped" (L.H.) pupils (learning disabled and educationally retarded) who were considered mildly handicapped. These L.H. pupils were enrolled in either resource specialist programs or L.H. special classes (Gartin, 1980). Many of

these pupils were recommended for summer school because their teachers indicated they might severely regress in academic skills without summer school academic intervention.

Research concerning academic achievement over the summer vacation period has centered on the regular education population (Hoepfner, 1980; Botwin, 1975; Fitzsimmons, 1969). There is concern as to whether these research results apply to the special education population. Unless further research is conducted concerning academic retention of the Learning Handicapped population over summer vacation, there may be a proliferation of summer school programs founded on the basis of State Department directives rather than on research which would indicate that such services are required.

There is the possibility that the Learning Handicapped population may more closely resemble the regular education population by not showing significant regression in academic skills over the summer vacation period. Consequently, the retention of academic skills for Learning Handicapped pupils over summer vacation becomes an important question when considering the financial impact of providing summer school to special education pupils.

PROBLEM AND PURPOSE

The purpose of this study was to analyze the relative impact of summer vacation on the retention of selected

academic skills (reading and arithmetic) for learning disabled pupils compared to non-disabled pupils.

The specific question undertaken was:

> Are there significant differences in the retention of selected reading and arithmetic skills over summer vacation by learning disabled pupils compared to non-disabled pupils?

HYPOTHESES

1. There are significant differences between learning disabled special class pupils and non-disabled regular education pupils in terms of reading recognition scores over the summer vacation period.

2. There are significant differences between learning disabled special class pupils and non-disabled regular education pupils in terms of arithmetic scores over the summer vacation period.

3. There are significant differences between learning disabled resource specialist pupils and non-disabled regular education pupils in terms of reading recognition scores over the summer vacation period.

4. There are significant differences between learning disabled resource specialist pupils and non-disabled regular education pupils in terms of arithmetic scores over the summer vacation period.

SIGNIFICANCE OF THE STUDY

The California State Department of Education has indicated that summer school programs must be available to all

special education pupils whose skills might "severely regress" over the summer vacation period (Duck, 1980).

The study will provide empirical evidence as to the severity of regression in academic skills experienced by learning disabled pupils over the summer vacation period when compared to a regular education population.

This will allow for an indication of which group of pupils have a greater risk of regressing in academic skills over summer vacation and consequently require additional educational service, i.e. special summer school classes, tutoring.

DELIMITATIONS OF THE STUDY

For the purpose of this study, the sample consisted of 294 pupils from 14 school districts in Stanislaus County (California), who were classified as non-handicapped (regular education) pupils and learning disabled pupils. The learning disabled population was drawn from pupils who were considered mildly handicapped and were enrolled in resource specialist programs (N = 108) or in special education classes (N = 58) for a majority of the school day. The pupils were between chronological ages six years zero months to eleven years eight months, (second through sixth grades). There was no control for the pupils' learning environments during the preceding year nor the activities they engaged in over summer

vacation. None of the pupils were enrolled in a public education summer school program.

Stanislaus County has been involved in the California Master Plan for Special Education since 1974 (School Appraisal Team Manual, 1980) under provisions of the California Education Code, commencing with Section 56330. The results of this study may not be applicable to non-Master Plan regions.

DEFINITION OF TERMS

1. Regression. To move in a backward direction, i.e. decline in academic test scores, gradual loss of memories or acquired skills (Webster's New International Dictionary, 1959).

2. Retention. The preservation of after-effects of experience and learning so that recall or recognition is possible or that relearning is easier than learning new material (Webster's New International Dictionary, 1959).

3. Learning Handicapped. A generic term used in California to classify children who have learning disabilities, behavior disorders, education retardation (Stanislaus Special Education Service Region Manual, 1980), (SSESR).

4. Summer Vacation. The period of time during the summer when, traditionally, school is not in session. In Stanislaus County this usually starts June 8-13 and ends

September 3-9 (Stanislaus County Department of Education Calendar).

5. Individual Education Program (I.E.P.). The program developed by the I.E.P. team which includes the individual pupil's levels of performance, goals, short term objectives, and services to be provided (including summer school). The I.E.P. team is composed of the pupil's parents, school administrator, special educator, regular teacher, and others as appropriate (Federal Register, 1977).

6. Reading Skills. Those skills measured by the Wide Range Achievement Test, Reading Subtest. Reading is the process of transcoding a series of visual-kinesthetic symbols into vocal or sub-vocal sound sequences. It also includes recognizing and naming letters and pronouncing words as measured by the Wide Range Achievement Test (Jastak, 1978).

7. Arithmetic Skills. Those computational skills measured by the Wide Range Achievement Test including "counting, reading number symbols, solving oral problems and performing written computations" (Jastak, 1978).

8. Learning Disabled. Those pupils who have a disorder in one or more of the basic psychological processes involved in understanding or in using language, spoken or written, manifesting itself in imperfect ability to listen, think, speak, read, write, spell, or do mathematic calculations. Such disorders include such conditions as perceptual handicaps,

brain injury, minimal brain dysfunction, dyslexia and developmental aphasia. Such term does not include pupils who have learning problems which are primarily the result of visual, hearing, or motor handicaps, of mental retardation, or emotional disturbance, or of environment disadvantage (Federal Register, 1977, p. 7411).

9. Educationally Retarded. (Interchangeable with Educable Mentally Retarded - E.M.R.). Pupils who have significantly subaverage general intellectual functioning existing concurrently with deficits in adaptive behavior and manifested during the developmental period (Grossman, 1963).

10. Resource Specialist Program. A program which services mildly handicapped pupils. Pupils enrolled in this program must have a diagnosed handicap and are enrolled for a majority of the school day in regular classes (S.S.E.S.R. Manual, 1980).

11. Special Class. A special education service option for handicapped children. It is usually composed of a group of pupils assigned to a particular class on the basis of some disability (e.g. learning disabilities, educable mental retardation, emotional disturbance) and given instruction by teachers with specific training for work in the area of the pupils' disability; usually grouped into chronological

age spans from two to four years and usually in class size under 12 (Grossman, 1973).

12. Regular Education Pupils. Pupils who are attending public elementary schools but not enrolled in resource specialist programs or special classes.

13. Recoupment. The act of regaining skills once mastered and then lost or forgotten (Webster's New International Dictionary, 1959).

SUMMARY

This study was designed to research what impact summer vacation has on the learning disabled pupils enrolled in resource specialist programs and special classes in reading and arithmetic skills.

Chapter two provides a review of the literature pertaining to the retention of reading and arithmetic skills over summer vacation. The retention of selected reading and arithmetic skills by learning disabled pupils over the summer vacation is an important area of study as decisions on whether to provide summer school for this population are currently being determined.

Chapter 2

REVIEW OF THE LITERATURE

This chapter will review the results of previous investigations which are pertinent to the present study. Previous investigations of summer vacation retention have involved pupils from kindergarten through college levels. Since the present study is concerned with subjects in an elementary setting, only those studies dealing with similar age groups will be reviewed.

None of the studies reviewed dealt specifically with a special education population.

The review will be presented in three sections:

1. Studies in retention of reading skills
2. Studies in the retention of arithmetic skills
3. Summary of the literature.

STUDIES OF READING RETENTION

Several studies have analyzed the retention of reading skills over the summer vacation period. The majority of these studies found that pupils gained in reading skills over the summer vacation period. Bruene (1928) tested 79 fourth through sixth grade pupils in May and then again in September. She found a slight increase in reading skills for fourth and fifth grade pupils. Sixth grade pupils gained .23 of a year's growth. The author speculated that this

gain was "probably due to the pupils' recreational reading during the summer vacation."

Morgan (1929) studied the effects of pre-training a group of sixth grade pupils in May on specific reading and arithmetic skills and then re-testing the experimental and control groups two weeks later. The two week training period increased the experimental group's reading skills by 20 months while the control group gained one month on the first post-test in June. In September both groups were again tested to study whether any gains made during the pre-training were retained over the vacation period.

Over the summer vacation period, the control group gained three months in reading skills, while the experimental group gained two months. Consequently, the experimental group maintained its pre-training growth while the control group gained more in reading skills over the summer vacation period. Both groups increase their skill levels over the summer vacation period.

Schrepel and Laslett (1936) studied the effects of summer vacation on the reading skills of 120 junior high school pupils. They found that the pupils "returned to school in September with greater reading ability than they had when they left school in June."

Botwin (1965) studied 192 randomly selected subjects in second through seventh grade. Improvement in reading

scores were found from the May pretest to the September post-test. Botwin summarized the study: "The fact that gains in achievement did occur over the summer vacation indicated that summer does not have a deleterious effect on academic achievement."

Hoepfner (1980) followed regular and compensatory education pupils in third through sixth grade over a three-year period. One component of the study dealt with compensatory education subjects who attended summer school. Hoepfner found that all groups studied made gains in reading skills over the summer and that those who attended summer school showed less growth during the following regular school year.

While the preceding studies indicated reading growth over the summer vacation period, others found no growth. Morrison (1924) investigated what effect the summer vacation had on academic achievement with 200 pupils in second through seventh grade. The author found no change in reading ability over the summer vacation for the group of pupils tested.

Keys and Lawson (1937) deviated in method from previous researchers by pretesting in May and post-testing in October for three consecutive years. The pupils were in fourth through seventh grades. Keys and Lawson believed that previous studies neither followed pupils long enough nor indicated if summer gains were maintained. Instead of the

three month summer period, they used a five month period (May to October). The authors found that significant loss of skills occurred in several subject areas. In reading, however, the skills remained constant over the summer vacation period.

Aasen (1959) studied whether a voluntary summer reading program would improve the reading ability of fourth grade pupils. The total sample was 96 pupils with 64 pupils in the experimental group.

The experimental group was told what their reading grade level was after the pre-test in June and given lists of books to read over the summer vacation. Letters were also sent to parents encouraging them to assist their children in checking out library books during the summer. In September, the experimental group had improved seven months in reading skills while the skills of the control group remained constant.

Fitzsimmons (1969) found similar results while assessing summer vacation retention of 440 fourth and fifth graders in reading skills. Fitzsimmons found:

1. No real difference existed between June and September reading scores.
2. Retention in reading for average I.Q. pupils was significantly less than for high and low I.Q. pupils.

3. Low I.Q. pupils retain reading skills best.

Two studies indicated that pupils' reading skills actually decreased over the summer vacation period. Patterson (1925) examined 149 fourth through sixth graders for the effect of summer vacation on reading achievement for pupils with sub-normal, normal, and supernormal intelligence. In reading, the sub-normal subjects had higher post-test scores than normal and supernormal subjects.

Cook (1942) conducted research with second and third grade pupils on summer vacation reading loss. She found that second and third grade pupils declined three months in reading skills as measured by Gates Primary Reading Tests and declined four months in skills as measured by the Metropolitan Achievement Tests. In attempting to intervene in this situation, she experimented with reading skills packages for pupils to study during summer vacation. She reported that the use of the skill packages enabled pupils to maintain their May skills through to September.

STUDIES IN ARITHMETIC RETENTION

Researchers appear to agree that there is a loss of arithmetic skills over the summer vacation period. Garfinkel (1919) studied 747 fifth, sixth and seventh grade pupils for retention of arithmetic skills over summer vacation. He found a decrease in both speed and accuracy for all groups studied.

Morrison (1924) based his research on 200 first through eighth grade pupils. He found significant losses in the "ability of pupils to correctly solve problems representing fundamental operations in arithmetic." Seventh and eighth grade pupils, however, gained in multiplication skills.

Patterson and Rensselaer (1925) examined 149 fourth through eighth grade pupils. The authors found that all groups decreased in skill level over the summer vacation period. The authors recommended all grades be given intensive drill in fundamentals at the beginning of the fall semester.

Brueckner (1927) studied 177 second grade pupils and found that there was no decrease in knowledge of basic addition facts. Ability in subtraction facts decreased significantly. There was no difference between boys and girls nor between seven year old pupils and eight year old pupils.

Bruene (1928) studied fourth, fifth and sixth grade pupils and tested arithmetic fundamentals and arithmetic reasoning. Arithmetic fundamentals showed a six months' loss in skills from June to September. Arithmetic reasoning remained constant. Bruene attributed the loss in arithmetic fundamentals to pupils needing drill to maintain these skills.

Morgan (1929) examined the retention of skills over summer vacation for 78 sixth grade subjects. One group of 40 pupils was given a special two-week training session at the end of May in basic arithmetic skills while the other 38 pupils were not. Morgan found that his experimental group gained in skills before school ended in June. Both groups, however, lost approximately three months in arithmetic skills over the summer vacation period.

Keys and Lawson (1937) examined 164 fourth, fifth and sixth grade pupils over a three year period and tested each group for retention of skills over three consecutive summer vacations. Fundamental operations of arithmetic regressed 4.2 months in the May to September testing. The authors conclude that those skills that require drill (i.e. arithmetic and spelling) tend to regress more over the summer vacation period than other skills.

Botwin (1965) studied 192 second through seventh graders. Differences in intelligence as well as academic areas were analyzed. There was a slight decline in arithmetic skills for all groups tested. Second grade pupils scored lower than other pupils following summer vacation. The author concluded that more readiness work should be given to first and second grade pupils in arithmetic fundamentals.

Hoepfner (1980) analyzed the impact of summer vacation on compensatory education and regular education pupils. One

group of pupils attended summer school. Hoepfner stated that "absolute summer achievement decline is not common. When it is observed, the decline is very small and likley to be in Math. Attendance at summer school appears to have no strong ameliorative effect on achievement, either short term or long term."

SUMMARY OF RESEARCH

Studies of retention of academic skills over summer vacation have been conducted since 1906 (Sterrett & Davis, 1954). No research dealing specifically with the retention of skills over summer vacation by special education pupils was located.

In analyzing the studies involving the retention of reading skills, five researchers (Bruene, 1928; Morgan, 1929; Schrepel, 1936; Botwin, 1965; Hoepfner, 1980) reported gains in reading skills over the vacation period. Four researchers (Morrison, 1924; Keys, 1937; Aasen, 1959; Fitzsimmons, 1969) reported no significant gains or losses in reading skills as a result of the summer vacation. Patterson (1925) and Fitzsimmons (1969) found that low I.Q. pupils retained reading skills the best over summer vacation. Two researchers (Aasen, 1959; Cook, 1942) successfully intervened to improve their pupils' reading retention over the summer vacation period.

The nine studies involving summer vacation retention of arithmetic skills concurred that pupils' basic arithmetic skills decreased as a result of summer vacation. Several of them suggested that these skills required a high level of drill and practice and were not used by pupils to the extent that reading was used during the summer vacation period.

While the majority of researchers concluded that pupils did not regress and actually increased reading skills over summer vacation, other researchers found mean score losses. All researchers concurred that arithmetic skills decreased over the summer vacation period. They differed as to the degree of regression and reasons for it.

It is apparent that further research in retention of academic skills over summer vacation involving special education pupils would be appropriate.

Chapter three provides a description of the methods and procedures used in the study.

Chapter 3

METHODS AND PROCEDURES

This chapter describes the methods and procedures used in testing the four hypotheses of this study. It includes a description of the following: setting of the study, population, sample, instrumentation, statistical procedures, and summary.

SETTING OF THE STUDY

This study was conducted within Stanislaus County, California. Stanislaus County is in the San Joaquin Valley of central California. It is located 70 miles south of Sacramento, and 90 miles east of San Francisco. Modesto is both the largest city and the county seat.

The primary industries in the region are agriculturally related. Light manufacturing industries are also present.

The total population of the county is 275,500 (U. S. Census, 1980). The largest metropolitan center within the county is the city of Modesto, with a population of 106,000 (U. S. Census, 1980).

There are 29 school districts within Stanislaus County. The smallest is La Grange, with 25 students. The largest is Modesto Elementary and Secondary school districts with 20,000 pupils enrolled (see Appendix D for more information). All 29 school districts participate in the Stanislaus Special

Education Services Region (S.S.E.S.R.), which is the consortium responsible for delivery and evaluation of special education services within Stanislaus County.

Population

The population of this study consisted of pupils enrolled in 14 school districts within Stanislaus County (Appendix A). There were 28 schools within these districts participating in the study (see Appendix B).

The 14 participating school districts had a total enrollment of 28,713 pupils. The sample schools ranged in size from Hickman, with 177 pupils to Julien (Turlock), with 756 pupils. A description of the study population schools is found in Appendix B. This identifies schools participating in the study and the total school population and sample size from each school.

Eleven of the 28 schools participating in the study were receiving School Improvement Plan (SIP) funds (see Appendix A). The pupil population was composed of three groups: regular education pupils; pupils enrolled in the resource specialist program; and pupils enrolled in special classes for the Learning Handicapped.

All regular education pupils within the schools between age six years zero months and eleven years eight months were included in the population to be sampled.

All schools involved in the study, as well as all schools within Stanislaus County, had pupils enrolled in the resource specialist programs. These students were identified as having a specific learning disability. Seventeen of the 28 schools involved in the study had special classes for Learning Handicapped pupils (see Appendix A). The majority of the pupils enrolled in these classes were diagnosed as having a specific learning disability.

Sample

The sample consisted of 294 pupils. The control group was composed of 128 regular education pupils. These pupils were selected from 21 schools (see Appendix A) by the resource specialist or psychologist at each site. They were matched according to age with the resource specialist pupils. It was concluded this method would approximate the population mean by applying the law of large numbers (Hays, 1963). This law implies that the larger the sample size the more probable that it will arbitrarily approximate the population mean.

Table 1

PUPILS INCLUDED IN THE SAMPLE

	Number	Male	Female	$\bar{x}$-Age
Regular Education Pupils (Reg. Ed.)	128	62	65	9-9
Resource Specialist Pupils (Res. Sp.)	108	72	36	10-0
Special Class Pupils (Sp. Class)	58	29	29	9-9

The experimental groups consisted of pupils who were enrolled in resource specialist programs or special classes during the 1979-80 academic year. These pupils were diagnosed as having a specific learning disability with procedures established by the Stanislaus Special Education Services Region (S.S.E.S.R.).

The resource specialist sample consisted of 108 pupils. These pupils were selected from 19 schools (see Appendix B) by the resource specialist assigned to each school. Pupils were chosen because of their enrollment in the resource specialist program.

The special class sample consisted of 58 pupils enrolled in Learning Handicapped special classes. These pupils were selected from 13 school sites (see Appendix B) by the special class teacher or psychologist assigned to each school. Only pupils identified as having a specific learning disability were chosen for the sample group.

The Chi-Square analysis of sex and group showed a statistically significant difference in the number of males to females in the resource specialist sample. There were approximately equal numbers of males and females in both the regular education and special class samples (see Table 3). There was one pupil with no sex listed.

Table 2

Sample Frequencies by Sex and Group

	Regular Education	Resource Specialist	Special Class	Total
Male	62	72	29	163
Female	65	36	29	130
Total	127	108	58	293

Chi Square = 8.46 with 2 degrees of freedom.

Significance = .0145

Number of missing observations = 1

The pupils included within the sample were between the chronological ages of six years zero months to eleven years eight months. The mean ($\bar{x}$) chronological age for all pupils was nine years ten months. There were 163 males and 130 females in the sample population.

Table 3

Sample Population by Age and Group

Age as of Sept. 1980	Regular Education	Resource Specialist	Special Class	Total
6	1	0	0	1
7	1	2	1	4
8	10	9	3	22
9	39	18	16	73
10	32	34	21	87
11	45	45	17	107
TOTAL	128	108	58	294

Chi Square = 10.69 with 10 degrees of freedom.

Significance = .382.

The Chi Square analysis did not indicate any significant differences.

INSTRUMENTATION

The Wide Range Achievement Test (WRAT) 1978 edition, Level I Reading and Arithmetic subtests were administered to all pupils as a pre and a post-test of academic achievement. Jastak (1978) reported that the WRAT was first standardized in 1936 as a convenient tool for the study of the basic school subjects of reading, written spelling and arithmetic computation.

The subtests are divided into two levels, I and II. Level I is designed for pupils between the ages of five and 11 years. Level II is intended for subjects from 12 to adulthood. The three subject areas are Reading Recognition - naming letters and words; Spelling - writing single words from dictation; and Arithmetic - counting, reading number symbols, solving oral problems and performing written computations (Jastak, 1978).

Reliability

The split-half reliability coefficients have been established for the WRAT. There were 1400 subjects in the reliability study. Each age group (five through 11 years old) consisted of 200 pupils. The split half measures used were odd-even scores. Table 4 summarizes the split-half correlation coefficients and standard errors of measurement (SEM) (Jastak, 1978).

Table 4

Summary of Reliability Coefficients and Errors of Measurement for Three WRAT Subtests, Level I (7 groups, N - 200 each)

Test	Ages		SEM
Reading	5-11	.98	1.05-1.39
Spelling	5-11	.96	.86-1.20
Arithmetic	5-11	.94	.88-1.42

Test and retest reliability studies have indicated that the WRAT subtests may be safely repeated at three month intervals (Jastak, 1978).

Validity

The WRAT has been cross-referenced with other achievement tests. In a 1946 study measuring predictive validity indicated the WRAT subtests correlated with the "New Stanford Achievement Test" (Jastak, 1978).

WRAT Reading vs New Stanford Paragraph Reading - + .81 (N = 389).

WRAT Reading vs New Stanford Word Reading - + .84 (N = 389).

WRAT Spelling vs New Stanford Dictation Test - + .93 (N = 140).

WRAT Arithmetic vs New Stanford Arithmetic - + .91 (N = 140).

In a survey of achievement completed by the U. S. Public Health Service, the WRAT was compared with the Stanford and Metropolitan Achievement Tests on a national sample of pupils from first through twelfth grade. The WRAT subtests correlated highly with subtests on the other achievement tests that measured similar content.

A comparison of internal consistency between the subtests of the WRAT, Level I, showed a high degree of positive correlation as shown on Table 5 (Jastak, 1978).

Table 5

Intercorrelation Between WRAT Subtests, Level I
(N = 200 at each age level, total 1400)

Age	Reading vs. Spelling	Reading vs. Arithmetic	Spelling vs. Arithmetic
5	.799	.745	.752
6	.838	.794	.777
7	.887	.735	.751
8	.843	.691	.700
9	.901	.718	.727
10	.938	.746	.763
11	.934	.767	.761

The predictive validity of the WRAT was reported by Wagner (1962) to be significant as an indicator of reading mid-term grades for fifth grade pupils and correlated to the extent of +.88.

Administration of the Instrument

Each pupil was assessed with the WRAT using the reading and arithmetic subtests. The WRAT was administered to all pupils as a pretest during the last week of the 1979-80 school year (June 3-14, 1980).

The test was administered by two groups of professionals, who had been trained previously and had had experience using

this instrument. The instrument is simple to administer and score with very small chance of incorrect scoring (Jastak, 1978). School psychologists administered it to all regular education pupils and to Learning Handicapped special class pupils. Resource specialists administered the instrument to all pupils assigned to their programs.

Test results were transferred from the WRAT protocol to a summary sheet (see example, Appendix C). Summary sheets were then forwarded to the local Director of Special Education.

Before school convened in September, 1980, the summary sheets were returned to those professionals who had participated in the pre-testing with an explanation of testing procedure.

A post-test was administered to all those subjects who continued as pupils in the same program from the spring of 1980. Post-testing was conducted by the same professionals who did the pre-test and was completed within the first two weeks of school, September 3-14, 1980.

A three-month time period between pre-test and post-test was maintained as recommended by the WRAT Manual to insure test validity (Jastak, 1978).

Post-test results were recorded by those administering the instrument. Results included pre-test and post-test data and were returned to the local Director of Special Education.

Results were then forwarded to the Director of Special Education, Stanislaus County Department of Education.

RESEARCH DESIGN

The research design adopted in this study was appropriate for validation of the following hypotheses:

1. There are significant differences in the retention of reading recognition scores over summer vacation between learning disabled pupils enrolled in special classes and non-disabled pupils.

2. There are significant differences in the retention of arithmetic scores over summer vacation between learning disabled pupils enrolled in special classes and non-disabled pupils.

3. There are significant differences in the retention of reading recognition scores over summer vacation between learning disabled pupils enrolled in resource specialist programs and non-disabled pupils.

4. There are significant differences in the retention of arithmetic scores over summer vacation between learning disabled pupils enrolled in resource specialist programs and non-disabled pupils.

A one-way analysis of co-variance (ANCOVA) with the post-tests as the dependent variables and the pre-tests and age as co-variates was applied to determine the significance between the test score means of the group studied. Subjects' pre-test scores and their age differences were used as co-variates in order to remove any effect these irrelevant, pre-experimental individual differences had on the dependent variables.

The ANCOVA technique also adjusted for initial differences in pre-test scores and age. Significance was

established at the .05 level of significance with appropriate degrees of freedom (Nie, 1975).

The Statistical Package for the Social Sciences, (Nie, 1975) was used to analyze the data.

SUMMARY

This study was conducted within Stanislaus County, California. The population for this study consisted of pupils enrolled within 28 schools and 14 school districts.

The sample used in this study was: 128 regular education pupils, 108 resource specialist pupils, and 58 learning disabled special class pupils from Stanislaus County. Pupils were between the chronological ages of six years zero months to eleven years eight months at the beginning of the study.

The statistical procedure used was the analysis of co-variance (ANCOVA), which was considered appropriate for the purposes of this study. All significance was tested at the .05 level of significance.

Chapter four analyzes the significance of the four hypotheses that were tested.

Chapter 4

ANALYSIS OF DATA

The purpose of this study was to analyze the relative impact of summer vacation on the retention of selected academic skills (reading and arithmetic) for learning disabled pupils, compared to non-disabled regular education pupils. An Analysis of Co-Variance (ANCOVA) was used to analyze mean group differences while equating for initial differences in reading and math pre-test scores and age between the groups. Adjustment was made for initial differences because the control group had significantly greater reading and arithmetic skills than the experimental groups. A statistical comparison would not have been possible without this ANCOVA.

This chapter presents the results of the research procedures described in Chapter three. The results of testing each hypothesis is followed by a summary. Descriptive statistics for the groups involved in this study are presented in Appendices E to K.

HYPOTHESIS 1

There are significant differences between learning disabled special class pupils and non-disabled regular education pupils in terms of reading recognition scores over the summer vacation period.

The results are presented in Tables 6 and 7.

Table 6

ANCOVA Postreading by Group with Prereading and Age as Covariates

Source of Variation	Sum of Squares	D.F.	Mean Squares	F	Significance of F
Covariates (Y)	52378.315	2	26189.158	151.712	.001
Main Effects (X)	449.991	1	449.991	19.789	.001
Within	4138.559	182	22.739	-	-
TOTAL	56966.866	185	307.929	-	-

Table 7

Multiple Classification Analysis Postreading by Group with Prereading and Age as Covariates

Variable + Category	N	Pretest Unadjusted Mean	Posttest Unadjusted Mean	Posttest Adjusted Mean	BETA
Group					
1. Reg. Ed.	128	66.32	69.20	61.93	
3. Sp. Class	58	42.15	40.86	56.89	.13*

*2% of variance

The multiple classification analysis is presented in Table 7. It shows the unadjusted and adjusted post-test means and the BETA correlation.

Findings Related to Hypothesis 1

The mean post-test reading score of the experimental group (special class) was significantly different from the mean post-test reading score of the control group (regular education) even after adjusting for pre-test differences.

The unadjusted mean post-test score for regular education pupils was 69.20. The adjusted mean was 61.93. The unadjusted mean for special class pupils was 40.86. The adjusted mean was 56.89. After the adjustment of the means for initial differences, the mean score differences were significant at the .001 level. The hypothesis therefore was supported. The BETA coefficient, however, indicated that the percentage of variance of the adjusted post-test reading score attributable to group differences was two percent.

HYPOTHESIS 2

> There are significant differences between learning disabled special class pupils and non-disabled regular education pupils in terms of arithmetic scores over the summer vacation period.

The results are presented in Tables 8 and 9.

The multiple classification analysis is presented in Table 9. It shows the unadjusted and adjusted post-test means and the BETA correlation.

Table 8

ANCOVA Postmath by Group with Premath and Age as Covariates

Source of Variation	Sum of Squares	D.F.	Mean Squares	F	Significance of F
Covariates (Y)	5466.687	2	2730.843	407.551	.001
Main Effects (X)	280.200	1	280.200	41.817	.001
Within	1219.511	182	6.701	-	-
TOTAL	6961.000	185	37.629	-	-

Table 9

Multiple Classification Analysis Postmath by Group with Premath and Age as Covariates

Variable + Category	N	Pretest Unadjusted Mean	Posttest Unadjusted Mean	Posttest Adjusted Mean	BETA
Group					
1. Reg. Ed.	128	33.23	32.36	30.87	
2. Sp. Class	58	26.39	24.41	27.70	
					.24*

*6% of variance

Findings Related to Hypothesis 2

The unadjusted mean arithmetic score of the experimental group (special class) was 24.41. The adjusted mean score was 27.70. The unadjusted mean score for the control group (regular education) was 32.36. The adjusted mean score was 30.87.

The mean post-test arithmetic score of the experimental group (special class) was significantly lower than the mean post-test arithmetic score of the control group (regular education). After adjustment of the means for initial differences, the significance was at the .001 level. Consequently, the hypothesis was supported. The BETA coefficient indicated the percentage of variance of the adjusted post-test arithmetic scores attributable to group differences was six percent.

HYPOTHESIS 3

There are significant differences between learning disabled resource specialist pupils and non-disabled regular education pupils in terms of reading recognition scores over the summer vacation period.

The results are presented in Table 10 and 11.

The multiple classification analysis is presented in Table 11.

Table 10

ANCOVA Postreading by Group with Prereading and Age as Covariates

Source of Variation	Sum of Squares	D.F.	Mean Squares	F	Signifi-cance of F
Covari-ates (Y)	53585.563	2	26792.000	.712	.001
Main Ef-fects (X)	626.008	1	626.008	33.763	.001
Within	4301.560	232	18.541	-	-
TOTAL	58513.131	235	248.992	-	-

Table 11

Multiple Classification Analysis Postreading by Group With Prereading and Age by Covariates

Variable + Category	N	Pretest Unadjusted Mean	Posttest Unadjusted Mean	Posttest Adjusted Mean	BETA
Group					
1. Reg. Ed.	128	66.9	69.19	61.48	
2. Res. Sp.	108	48.6	47.81	56.95	
					.14*

*2% of variance

Findings Related to Hypothesis 3

The unadjusted mean reading score of the experimental group (resource specialist) was 47.81. The adjusted mean score was 56.95. The unadjusted mean score for the control group (regular education) was 69.19. The adjusted mean score was 61.48.

The mean post-test reading score of the experimental group (resource specialist) was significantly different from the mean post-test reading score of the control group (regular education). After adjustment of the means for initial differences, the significance was at the .001 level. Consequently, the hypothesis was supported. The BETA coefficient, however, indicated that the percentage of variance of the adjusted post-test reading score attributable to group differences was two percent.

HYPOTHESIS 4

> There are significant differences between learning disabled resource specialist pupils and non-disabled regular education pupils in terms of arithmetic scores over the summer vacation period.

The results are presented in Tables 12 and 13.

The multiple classification analysis is presented in Table 13.

Table 12

ANCOVA Postmath by Group with Premath and Age as Covariates

Source of Variation	Sum of Squares	D.F.	Mean Squares	F	Significance of F
Covariates (Y)	5413.827	2	2706.913	350.620	.001
Main Effects (X)	62.624	1	62.624	8.112	.005
Within	1791.125	232	7.720	-	-
TOTAL	7267.000	235	30.926	-	-

Table 13

Multiple Classification Analysis Postmath by Group with Premath and Age as Covariates

Variable + Category	N	Pretest Unadjusted Mean	Posttest Unadjusted Mean	Posttest Adjusted Mean	BETA
Group					
1. Reg. Ed.	128	33.23	32.36	30.61	
2. Res. Sp.	108	27.96	27.29	29.37	
					.11*

*1% of variance

Findings Related to Hypothesis 4

The unadjusted mean arithmetic score of the experimental group (resource specialist) was 27.29. The adjusted mean score was 29.37. The unadjusted mean score of the control group (regular education) was 32.36. The adjusted mean score was 30.61.

After adjustment of the mean post-test math scores for initial differences, the significance was at the .005 level. The mean post-test arithmetic score of the experimental group (resource specialist) was significantly different from the control group (regular education). Consequently, the hypothesis was supported. There was a statistically significant difference. The BETA coefficient, however, indicated that the percentage of variance of the adjusted post-test reading score attributable to group differences is one percent.

SUMMARY

An analysis of the data indicated that the four hypotheses were accepted. Significance was demonstrated at beyond the .01 level of confidence. There were significant differences in the retention of reading and arithmetic skills over summer vacation between learning disabled pupils and non-disabled pupils. The BETA coefficient, however, indicated that the level of support was weak. Chapter five discusses the conclusions, implications, and recommendations for further study.

Chapter 5

CONCLUSIONS, IMPLICATIONS AND RECOMMENDATIONS

In this chapter are presented the conclusions derived from the investigation together with the educational implications and suggestions for further research. The discussion which follows is so sequenced.

CONCLUSIONS

This study hypothesized that there were differences in the retention of reading and arithmetic skills between non-disabled regular education pupils compared with learning disabled pupils enrolled in resource specialist programs and Learning Handicapped special classes over the summer vacation period.

Reading Skills

Several previous studies (Bruene, 1928; Morgan, 1929; Schrepel, 1936; Botwin, 1965; and Hoepfner, 1980) concerned with reading retention over summer vacation concluded that regular education pupils show increases in their reading skills over the summer vacation period. The following table converts the raw score data in Chapter four into grade score equivalents (see Appendix K).

Table 14

WRAT Reading Score Grade Equivalents

	PRETEST		POSTTEST		
	Raw Score	Grade Equiv. (Sch. Yrs.)	Raw Score	Grade Equiv. (Sch. Yrs.)	Gain/Loss (Months)
Regular Education	66.3	5.7	69.2	6.2	+ 5
Resource Specialist	48.6	3.0	47.8	2.9	- 1
Special Classes	42.2	2.6	40.8	2.5	- 1

A review of the literature revealed no studies that tested learning disabled pupils over the summer vacation. In this study, regular education pupils made five months growth in reading skills. Resource specialist and special class pupils' reading skills decreased by one month. The ANCOVA using age and sex as covariates concludes that the learning disabled scored significantly lower on the post-test reading skills.

Studies reviewed in the literature concluded that pupils' significant gains were made because they continued to use their reading skills during the summer months in pleasure reading and in informational reading.

This study might suggest that learning disabled pupils who are poor readers may not read for pleasure during the summer months. Because reading may not be an easy task for them, they do not practice their reading skills. Consequently, their lack of practice may lead to a decline in skills.

Arithmetic Skills

Nearly all of the previous studies on the retention of arithmetic skills over summer vacation concluded that regular education pupils retained less information on post-test than they did on a pre-test. Table 15 converts the raw score data of Chapter four into grade score equivalents (see Appendix L).

Table 15

WRAT Arithmetic Grade Score Equivalents

	PRETEST		POSTTEST		
	Raw Score	Grade Equiv. (Sch. Yrs.)	Raw Score	Grade Equiv. (Sch. Yrs.)	Gain/Loss (Months)
Regular Education	33.2	4.5	32.3	4.3	- 2
Resource Specialist	28.0	3.5	27.2	3.3	- 2
Special Classes	26.3	3.1	24.4	2.7	- 4

These data also concur with the findings of previous studies. Regular education pupils demonstrated a loss of arithmetic skills over the summer vacation period. While there was no difference in the amount of loss between the regular education and resource specialist pupils in terms of months' grade loss, the statistical analysis indicated that resource specialist pupils retained significantly fewer arithmetic skills than regular education pupils.

No previous research was located which studied a learning disabled population for summer vacation arithmetic skills decline.

Previous researchers concluded that the decline in arithmetic skills was due to a lack of practice over the summer vacation period. The greater loss of arithmetic skills by the special class pupils could possibly be attributed to a number of factors and deserves further study.

BETA Analysis

Another aspect of this study which must be explored is how much practical significance can be attached to the results. The BETA coefficient squared gives the researcher the percentage of variance of the dependent variable that can be attributed to the independent variable after adjustment for covariates.

The presence of the significant F test gives us some assurance that a statistical association exists, that is,

that the group means "differ significantly." Test of significance itself does not directly reflect the degree of this statistical association. BETA squared provides this information in a directly interpretable form as percent of variance of the dependent variable controlled by the adjusted independent variable, and thus augments any inference to be drawn from the outcome of the experiment.

The percentage of variance can reinforce the meaning of a significant finding. Not only is there some association but the BETA coefficient can reveal what percentage of the association is due to the dependent variable (Hays, 1963; Keppel, 1973).

The adjusted percentages of the variances ($Beta^2$) of the reading and arithmetic post-tests controlled by differences between the two experimental groups and the control group, respectively, are shown in Table 16.

Table 16

Percentage of Variance ($Beta^2$)

	Reading	Arithmetic
Resource Specialist vs. Regular Education	2%	1%
Special Classes vs. Regular Education	2%	6%

A review of the previous three tables shows that while regular education pupils' reading skills increased by five months, resource specialist and special class pupils' reading scores declined by one month. The gain for regular education pupils is a raw score increase of three points, but, the WRAT conversion tables translate this into a five month gain. The adjusted percentage of variance of percentage controlled for each group is two percent. It would appear, in view of the low association the independent variable has on the reading scores, no major program changes be implemented until further research is conducted. The author will discuss several directions for this research at the conclusion of this chapter.

In arithmetic, the adjusted percentage of variance for each hypothesis was one percent and six percent, respectively. The fact that regular education vs. resource specialist differences controlled only one percent of the post-test variances leads the author to conclude that the hypothesized effect was extremely weak even though we can be quite confident that this small effect is real, since the probability of the F ratio was smaller than .005. The significance of F for this group was .005, and was the weakest association of the four hypotheses.

The most powerful effect was due to differences between regular education pupils vs. special class pupils in

arithmetic. The adjusted variance was six percent, the decline in the special class mean score was two months lower than the decline for the other two groups. Once again, the author believes further research is indicated to substantiate the practical significance of this decline.

While the hypotheses were confirmed, the level of acceptance was weak (as indicated by the BETA coefficient) and the author suggests further research is needed before any major program changes be undertaken.

IMPLICATIONS FOR FURTHER STUDY

The present study has found that learning disabled pupils retain significantly fewer skills in reading and arithmetic over the summer vacation period. Although these findings might be interpreted to support summer school programs or other program changes for the learning disabled population, some caution should be exercised before any changes are implemented. The author does not believe that this present study indicates what would be the preferred intervention for the learning disabled to maintain their reading and math skills. Several issues and alternatives need to be explored.

First, it is accepted that reading and arithmetic skills regress over summer vacation for learning disabled pupils. If this is true, the recoupment capacity (time involved in pupils' relearning previously acquired skills) for these

pupils to regain their previous levels of skills in September needs to be determined. If their recoupment time is a minor factor, for example, only three weeks of review is needed, then other interventions might not be needed. If to relearn skills requires two or three months of instructional effort, then a summer intervention program might be indicated.

Second, if a summer intervention program is indicated, then one alternative might be the development of a home-based intervention model as described by previous researchers (Cook, 1942; Aasen, 1959). If it could be shown to be effective, this would be a much more cost efficient method.

Summer school programs available to the learning disabled population could be studied to determine whether they are effective in assisting these pupils to retain significantly more reading and arithmetic skills.

This study has provided baseline data relative to the retention of reading and arithmetic skills of learning disabled pupils over summer vacation. Further research should be conducted to evaluate methodology which might be most effective in increasing the retention of these pupils.

SUGGESTIONS FOR FURTHER RESEARCH

The findings of this study indicate that the following questions should be explored:

1. Is summer school an effective alternative leading to the retention of academic skills for the learning disabled population?
2. Could a planned program of summer activities conducted within the pupil's home lead to academic retention?
3. What is the recoupment time of learning disabled pupils to relearn previously obtained skills?

REFERENCES

Aasen, Helen B. "A Summer's Growth in Reading." Elementary School Journal, 60:70-74, November, 1959.

Blackman, Leonard S. "Psychological Factors Related to Early Reading Behavior of E.M.R. and Non-Retarded Children." American Journal of Mental Deficiency Vol. 77, No. 2 p. 212-29, September 1972.

Botwin, J. R. "Summer And School Year Correlated of Academic Achievement." Unpublished doctoral dissertation, Western Reserve University, 1965.

Bradley, John M. "Evaluating Reading Achievement for Placement in Special Education." Journal of Special Education. 10(3):237-45. Fall 1976.

Bray, Nancy & Estes, Robert. "A Comparison of the PIAT, CAT, and WRAT Scores and Teacher Ratings for Learning Disabled Children." An Overview of Selected Formal Tests For Resource Specialists (Unpublished collection of critiques, etc.). Santa Barbara, California, November 1975. p. 106.

Brueckner, Leo J. "Certain Arithmetic Abilities of Second Grade Pupils." TAE Elementary School Journal, 27:433-434, February 1927.

Breuchner, Leo J. & Distad, H. W. "The Effect of Summer Vacation on the Reading Ability of First Grade Children." Elementary School Journal, 24:698-707, May 1924.

Bruene, Elizabeth. "Effect of the Summer Vacation on the Achievement of Pupils in the Fourth, Fifth and Sixth Grades." Journal of Educational Research, 18:309-14, November 1928.

Bruning, James L. & Kintz, B. L. Computational Handbooks of Statistics. Glenview, Scott, Foresman and Company, 1977.

Buros, Oscar (ed.). The Third Mental Measurements Year Book. Highland Park, New Jersey: The Gryphon Press, Vol. I, 1949.

Buros, Oscar. The Seventh Mental Measurements Yearbook. Highland Park, New Jersey: The Gryphon Press, Vol. I, 1972, p. 68.

Campbell, Davis W. "Planning for 1980 Summer School and the 1980-81 School Year." California Department of Education memo, March 21, 1980.

Christian, Walter P. "Relationships Among Three Measures Used in Screening Mentally Retarded For Placement in Special Education." Psychological Report, Vol. 33, #2, p. 415-418, October 1973.

Cook, Ruth C. "Vacation Retention of Fundamentals by Primary Grade Pupils." Elementary School Journal, 43:214-19, December 1942.

Davis, Robert A. & Rood, Edward J. "Remembering and Forgetting Arithmetical Abilities." Journal of Educational Psychology, 38:216-22, April 1947.

Duck, Gordon. "Extended School Year of Individuals With Exceptional Needs." California Department of Education memo, May 29, 1979.

Federal Register, Part 121a.5 of Title 45 of the Code of Federal Regulations, Approved December 19, 1977, Washington, D. C.: Government Printing Office.

Fitzsimmons, M. E. "An Analytical Study of the Retention of Selected Skills by Intermediate Grade Pupils After the Summer Recess." Unpublished doctoral dissertation, Fordham University, 1969.

Garfinkel, Maurice A. "The Effect of the Summer Vacation on Ability in the Fundamentals of Arithmetic." Journal of Educational Psychology, 10:44-58, January 1919.

Gartin, Robert W. "Special Education Extended School Year - 1980 Waiver Procedure." California Department of Education memo, June 23, 1980.

Good, Carter U. (ed.). Dictionary of Education. New York: McGraw-Hill Book Company Inc., 1959, p. 676.

Grossman, Herbert J., M. D. Manual on Terminology and Classification in Mental Retardation 1973 Revision Baltimore: Garamond/Pridemark, p. 11, 160.

Hays, William L. Statistics for Psychologists, Holt, Rinehart and Winston, New York. 1963, p. 383.

Hoepfner, R. "How Important Is Summer School." Educational Leadership, 38:80-82, October, 1980.

Jastak, J. F., & Jastak, S. R. Wide Range Achievement Test. Wilmington: Jastak Associates, Inc. 1978.

Josephina, Sister. "Difference in Arithmetic Performance." Arithmetic Teacher, 5:152-53, February, 1959.

Keppel, Geoffrey. Design and Analysis, A Researchers Handbook. Prentice-Hall, Inc., New Jersey, 1973, p. 554.

Keys, N. & Lawson, J. V. "Summer vs. Winter Gains in School Achievement." School and Society, 46, 541-544, October 1937.

Kirk, Samuel A. & Gallagher, James J. Educating Exceptional Children. Boston: Houghton Mifflin Company, 1979, p. 545.

Klausmeier, Herbert J. & John F. Feldhusen. "Retention in Arithmetic Among Children of Low, Average and High Intelligence at 117 Months of Age." Journal of Educational Psychology, 50:88-92, April, 1959.

Kolberg, O. W. "A Study of Summer Time Forgetting." Elementary School Journal, 35, 281-287, December 1934.

Larsen, Larry; Goodman, Libby & Glean, Richard. "Issues in the Implementation of Extended School Year Programs for Handicapped Students." Exceptional Children, 47:256-263, January 1981.

Lenord, Judith. "180 Day Barrier: Issues and Concerns." Exceptional Children 47:246-253, January 1981.

Leviton, H. & Kiraly, J. "Summer Compensatory Education: Effects on Learning Disabled Children." Exceptional Children, 1975, 42, 48-49.

Morgan, L. D. "How Effective Is Specific Training in Preventing Loss Due to The Summer Vacation." Journal of Educational Psychology, 20:466-471, September 1929.

Morrison, J. Cayce. "What Effect Has the Summer Vacation on Children's Learning and Ability to Learn?" Ohio State University Educational Research Bulletin, 1924, 3, 245-249.

Nie, Norman; Hull, C. H.; Jenkins, J. G.; Steinbrenner, K. & Brent, D. H. Statistical Package for the Social Sciences (SPSS) Second Edition, New York: McGraw-Hill, 1975.

Patterson, Mildred V. W. & Rensselser, N. Y. "The Effect of Summer Vacation on Children's Mental Ability and on Their Retention of Arithmetic and Reading." Education, 46, 222-228, December 1925.

Schrepel, Marie & Laslett, H. R. "On The Loss of Knowledge by Junior High School Pupils Over Summer Vacation." Journal of Educational Psychology, 27, 299-303, April, 1936.

Soethe, James W. "Concurrent Validity of the Peabody Individual Achievement Test." Journal of Learning Disabilities, 5:560-562, November 1972.

Spitzer, Herbert. "A Study of Retention in Reading." Education Abstracts, 1940, 5, 533-534.

Stanislaus Special Education Services Region (SSESR). School Appraisal Individual Educational Program Team, Educational Assessment Services Manual of Policies and Procedures. Stanislaus County Department of Education, Modesto, 6th Revision, September 1980, p. 118.

Sterrett, M. D. & Davis, R. A. "The Permanence of School Learning: A Review of Studies." Educational Administration and Supervision, 1954, 40, 449-460.

Sutaria, S. "A Summary Program For Children With Learning Disabilities." Journal of Learning Disabilities, 1979, Vol. 12, Number 3, pp. 58-60.

Tiedeman, Herman R. "A Study of Retention of Classroom Learning." Journal of Educational Research, 41, 516-531, March 1948.

Tuemmler, Lana S. "A Comparative Study of Resource Specialist Students to Regular Class Students on Academic Achievement, School Attitudes and Self-Concept." Masters Thesis, California State College, Stanislaus, 1978.

U. S. Government Printing Office. 1980 Preliminary Counts of Cities, Counties, and States - U. S. Census, 1981.

Webster's New International Dictionary, Second Edition. G. & C. Merriam Co., Cambridge Mass.: 1959.

APPENDIX A

SCHOOL PARTICIPATING IN THE STUDY WITH SAMPLE POPULATION SHOWN

APPENDIX A

SCHOOLS PARTICIPATING

IN THE STUDY WITH SAMPLE POPULATION SHOWN

District/ School	LH Spec. Class	SAMPLE POPULATION Regular Ed. Pupils	Res. Sp. Pupils	Sp. Class Pupils	Totals Per School	Totals Per District
CHATOM						
Chatom	No	5	1		6	
Mt. View		5	13		18	24
DENAIR						
Denair Elem.	Yes	11	11	1	23	23
EMPIRE						
Capistrano	Yes	4		1	5	
*Empire Elem.	Yes	3		9	12	
Sipherd	No		14		14	31
HART-RANSOM	No	10	3		13	13
*HICKMAN	No	12			12	12
*KEYES	No	10	1		11	11
MODESTO						
Beard	Yes	2		1	3	
Enslen	Yes			3	3	
Everett	Yes		3	1	4	
Garrison		1			1	
*Marshall		4	5		9	
Muir	Yes	4	1	3	8	
*Shackelford	Yes	4	11	4	19	
Sutter	Yes	1	1		2	
*Tuolumne			1		1	
*Washington			1		1	
*Wright		1	2		6	57

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APPENDIX (Cont'd)

District/ School	L.H. Spec. Class	SAMPLE POPULATION Regular Ed. Pupils	Res. Sp. Pupils	Sp. Class Pupils	Totals Per School	Totals Per District
NEWMAN						
*Von Renner	Yes	7			7	7
OAKDALE						
Fair Oaks	Yes			5	5	5
SALIDA	Yes	10	10	7	27	27
STANISLAUS UNION						
Stanislaus Union	Yes	10	12	8	30	30
SYLVAN						
Sylvan	Yes	1	7	11	19	19
TURLOCK						
*Cunningham	Yes		3		3	
Julien	Yes	11	7	5	23	26
WATERFORD	Yes	9			9	9
TOTALS		128	107	59	294	294

*School Improvement Plan (S.I.P.) Schools

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APPENDIX B

SAMPLE POPULATION BY DISTRICT AND GROUP

APPENDIX B

SAMPLE POPULATION BY DISTRICT AND GROUP

District	+Rural or Suburban	Total K-8 Enrollment	Total No. K-8 Sch.	No. of School* Participating	SAMPLE POPULATION Regular Educ.	Resource Spec.	Special Class	Total
Chatom	Rural	567	2	2	10	14		24
Denair	Rural	756	2	1	11	11	1	23
Empire	Suburban	1,799	4	3	7	14	10	31
Hart-Ransom	Rural	278	1	1	10	3		13
Hickman	Rural	177	1	1	12			12
Keyes	Rural	461	1	1	10	1		11
Modesto	Suburban	10,955	20	11	20	25	10	55
Newman	Rural	670	3	1	7			7
Oakdale	Rural	1,949	4	1			5	5
Salida	Rural	479	1	1	10	10	7	27
Stanislaus Union	Suburban	2,115	4	1	10	12	8	30
Sylvan	Suburban	4,136	7	1	1	7	8	16
Turlock	Suburban	3,774	6	2	11	10	5	26
Waterford	Rural	588	2	1	9			9
TOTAL		28,713	58	28	128	107	54	289

+Nine rural districts with 131 sample members. Five suburban districts with 158 sample members
*See Appendix for information on participating schools.

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APPENDIX C

RAW DATA SUMMARY SHEET

801 County Center III Court
Modesto, CA 95355

Stanislaus County Department of Education

JOHN B. ALLARD
County Superintendent of Schools

School Name _____

Name	Birth Date	READING Pre-Test	READING Post-Test	MATH Pre-Test	MATH Post-Test	CHECK ONE: Educ.	Res. Spec.	Special Class

APPENDIX D

COMPUTER LIST OF CASES

SUMMER VACATION RETENTION; 81/04/16. 12.33

FILE *DSNAME (CREATION DATE = 81/04/16.)

CASE-NO	ID	SEX	GROUP	PREREAD	PREMATH	POSREAD	POSMATH	AGE
1	1.	2.	1.	53.	29.	56.	28.	5.
2	2.	2.	1.	72.	30.	72.	29.	4.
3	3.	2.	1.	58.	30.	57.	29.	3.
4	4.	2.	1.	68.	31.	66.	31.	4.
5	5.	1.	1.	64.	24.	67.	30.	4.
6	6.	1.	1.	74.	35.	77.	32.	6.
7	7.	2.	1.	82.	41.	77.	38.	6.
8	8.	2.	1.	64.	33.	82.	40.	6.
9	9.	1.	1.	67.	30.	67.	30.	4.
10	10.	1.	1.	57.	27.	57.	27.	4.
11	11.	2.	1.	65.	30.	70.	28.	5.
12	12.	1.	1.	85.	41.	86.	41.	6.
13	13.	2.	1.	76.	41.	75.	41.	6.
14	14.	1.	1.	68.	32.	69.	29.	6.
15	15.	2.	1.	71.	28.	75.	32.	4.
16	16.	1.	1.	54.	26.	53.	32.	5.
17	17.	1.	1.	63.	33.	70.	35.	6.
18	18.	1.	1.	39.	29.	41.	29.	6.
19	19.	2.	1.	58.	29.	54.	30.	4.
20	20.	2.	1.	71.	34.	69.	33.	4.
21	21.	1.	1.	71.	40.	71.	30.	4.
22	22.	2.	1.	54.	34.	56.	31.	4.
23	23.	2.	1.	67.	30.	69.	31.	5.
24	24.	1.	1.	62.	30.	60.	30.	4.
25	25.	2.	1.	56.	31.	56.	30.	6.
26	26.	1.	1.	52.	28.	59.	27.	5.
27	27.	2.	1.	70.	31.	64.	32.	4.
28	28.	1.	1.	64.	43.	75.	42.	6.
29	29.	1.	1.	67.	37.	79.	39.	6.
30	30.	2.	1.	66.	32.	72.	33.	5.
31	31.	2.	1.	71.	36.	73.	34.	6.
32	32.	2.	1.	69.	29.	73.	28.	5.
33	33.	1.	1.	79.	37.	80.	33.	5.
34	34.	2.	1.	58.	30.	70.	30.	4.
35	35.	2.	1.	59.	30.	59.	30.	4.
36	36.	2.	1.	48.	29.	40.	29.	5.
37	37.	1.	1.	81.	24.	81.	31.	5.
38	38.	1.	1.	84.	35.	89.	40.	6.
39	39.	1.	1.	59.	31.	59.	30.	6.
40	40.	2.	1.	72.	35.	75.	36.	6.
41	41.	2.	1.	61.	24.	60.	29.	4.
42	42.	2.	1.	63.	27.	60.	29.	3.
43	43.	1.	1.	59.	31.	54.	32.	5.
44	44.	1.	1.	55.	31.	60.	27.	4.
45	45.	2.	1.	73.	30.	71.	30.	4.
46	46.	2.	1.	54.	34.	50.	34.	4.
47	47.	1.	1.	59.	24.	56.	28.	5.
48	48.	1.	1.	54.	30.	56.	30.	4.

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SUMME- VACATION RETENTION 81/04/16. 12.33.11. PAGE

FILE NONAME (CREATION DATE = 81/04/16.)

CASE-NO	ID	SEX	GROUP	PREREAD	PREMATH	POSREAD	POSMATH	AGE
49	50.	1.	1.	68.	29.	68.	27.	5.
50	51.	1.	1.	61.	30.	61.	29.	4.
51	52.	2.	1.	85.	42.	91.	34.	6.
52	53.	2.	1.	75.	41.	75.	39.	6.
53	54.	2.	1.	73.	42.	71.	34.	6.
54	55.	2.	1.	55.	40.	68.	34.	5.
55	56.	2.	1.	63.	33.	65.	31.	5.
56	57.	1.	1.	73.	30.	76.	31.	5.
57	58.	2.	1.	49.	26.	52.	27.	3.
58	59.	2.	1.	70.	32.	72.	29.	4.
59	60.	1.	1.	71.	29.	80.	29.	3.
60	61.	2.	1.	65.	30.	67.	30.	3.
61	62.	1.	1.	77.	32.	82.	32.	4.
62	63.	1.	2.	64.	32.	64.	31.	4.
63	64.	2.	1.	95.	33.	89.	32.	4.
64	65.	2.	1.	85.	36.	91.	34.	4.
65	66.	2.	1.	58.	32.	56.	32.	5.
66	67.	2.	1.	62.	36.	53.	32.	5.
67	68.	1.	1.	59.	31.	54.	31.	5.
68	69.	1.	1.	71.	35.	71.	32.	5.
69	70.	2.	1.	56.	31.	55.	28.	5.
70	71.	1.	1.	74.	38.	83.	36.	6.
71	72.	2.	1.	56.	33.	55.	33.	6.
72	73.	1.	1.	68.	33.	72.	34.	5.
73	74.	2.	1.	65.	34.	66.	30.	5.
74	75.	2.	1.	71.	29.	75.	29.	4.
75	76.	2.	1.	59.	29.	72.	28.	4.
76	77.	2.	1.	54.	29.	55.	32.	5.
77	78.	1.	1.	51.	24.	56.	29.	6.
78	80.	2.	1.	46.	39.	49.	41.	6.
79	85.	2.	1.	57.	31.	62.	32.	4.
80	86.	2.	1.	67.	34.	74.	37.	5.
81	87.	1.	1.	78.	38.	76.	36.	6.
82	88.	2.	1.	56.	35.	71.	39.	6.
83	89.	2.	1.	77.	39.	89.	38.	6.
84	90.	1.	1.	53.	37.	64.	33.	6.
85	91.	1.	1.	44.	19.	46.	17.	3.
86	93.	2.	1.	78.	40.	84.	39.	6.
87	94.	2.	1.	70.	34.	79.	36.	6.
88	95.	1.	1.	66.	36.	77.	33.	6.
89	96.	1.	1.	49.	30.	56.	45.	6.
90	97.	1.	1.	76.	39.	79.	35.	6.
91	98.	2.	1.	91.	34.	93.	33.	6.
92	99.	2.	1.	73.	41.	71.	36.	6.
93	100.	2.	1.	71.	34.	74.	31.	5.
94	101.	1.	1.	87.	27.	90.	34.	5.
95	102.	1.	1.	93.	31.	90.	28.	5.
96	104.	1.	1.	78.	35.	80.	39.	6.

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SUMMER VACATION RETENTION 81/04/16. 12.33.11. PAGE

FILE ADNAME (CREATION DATE = 81/04/16.)

CASE-NO	ID	SEX	GROUP	PREREAD	PREMATH	POSREAD	POSMATH	AGE
97	103.	1.	1.	54.	31.	53.	30.	4.
98	104.	2.	1.	70.	31.	67.	30.	4.
99	107.	2.	1.	58.	30.	61.	29.	4.
100	108.	1.	1.	57.	33.	53.	30.	6.
101	109.	2.	1.	48.	23.	51.	23.	1.
102	110.	2.	1.	63.	29.	55.	27.	2.
103	111.	2.	1.	63.	28.	63.	28.	3.
104	112.	2.	1.	75.	34.	75.	33.	4.
105	113.	1.	1.	55.	26.	62.	28.	4.
106	114.	1.	1.	51.	29.	51.	27.	3.
107	115.	2.	1.	55.	29.	59.	30.	3.
108	116.	1.	1.	92.	37.	97.	41.	6.
109	118.	1.	1.	81.	36.	85.	34.	6.
110	119.	1.	1.	75.	34.	84.	31.	5.
111	120.	2.	1.	63.	34.	68.	32.	5.
112	121.	1.	1.	73.	41.	76.	44.	5.
113	122.	2.	1.	57.	34.	56.	28.	4.
114	123.	1.	2.	38.	27.	44.	26.	4.
115	124.	2.	2.	46.	29.	49.	27.	4.
116	125.	1.	2.	54.	29.	49.	28.	6.
117	127.	1.	2.	41.	22.	32.	24.	4.
118	128.	1.	2.	47.	26.	45.	25.	4.
119	129.	1.	2.	45.	31.	43.	27.	6.
120	131.	1.	2.	34.	23.	31.	24.	2.
121	132.	1.	2.	57.	27.	56.	25.	6.
122	133.	1.	2.	59.	26.	59.	26.	5.
123	134.	1.	2.	53.	30.	54.	27.	6.
124	135.	1.	2.	56.	31.	67.	29.	4.
125	136.	1.	2.	42.	31.	32.	30.	5.
126	137.	1.	2.	54.	24.	53.	24.	5.
127	138.	1.	2.	55.	31.	55.	28.	6.
128	139.	2.	2.	54.	30.	52.	30.	6.
129	140.	1.	2.	57.	34.	60.	30.	6.
130	141.	2.	2.	47.	29.	55.	26.	5.
131	142.	1.	2.	45.	30.	55.	30.	5.
132	143.	1.	2.	53.	29.	57.	29.	6.
133	144.	2.	2.	42.	31.	76.	30.	6.
134	145.	2.	2.	55.	30.	58.	29.	6.
135	146.	1.	2.	50.	32.	49.	28.	6.
136	147.	2.	2.	44.	27.	53.	24.	4.
137	150.	2.	2.	54.	31.	54.	29.	6.
138	151.	1.	2.	51.	25.	57.	27.	5.
139	152.	1.	2.	52.	29.	53.	29.	4.
140	153.	1.	2.	78.	36.	85.	34.	6.
141	154.	2.	2.	47.	27.	47.	26.	5.
142	155.	2.	2.	51.	29.	47.	27.	5.
143	156.	1.	2.	56.	29.	57.	29.	5.
144	157.	1.	2.	51.	29.	29.	22.	4.

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FILE NONAME (CREATION DATE = 81/04/16.)

CASE-NO	ID	SEX	GROUP	PREREAD	PREMATH	POSTREAD	POSTMATH	AGE
145	159.	1.	2.	53.	29.	52.	29.	6.
146	159.	1.	2.	51.	28.	44.	28.	6.
147	160.	1.	2.	56.	30.	54.	30.	6.
148	161.	1.	2.	54.	28.	58.	30.	6.
149	162.	1.	2.	50.	31.	49.	29.	5.
150	163.	1.	2.	50.	24.	52.	27.	6.
151	164.	1.	2.	42.	25.	48.	48.	4.
152	165.	2.	2.	27.	17.	28.	17.	2.
153	166.	1.	2.	63.	32.	67.	34.	6.
154	167.	1.	2.	51.	44.	48.	29.	5.
155	169.	2.	2.	31.	19.	25.	18.	3.
156	169.	1.	2.	23.	20.	25.	19.	3.
157	170.	1.	2.	27.	20.	28.	17.	4.
158	171.	2.	2.	70.	30.	65.	29.	6.
159	172.	2.	2.	51.	29.	51.	31.	6.
160	173.	1.	2.	49.	22.	56.	24.	5.
161	174.	1.	2.	38.	25.	39.	26.	4.
162	175.	1.	2.	41.	26.	39.	28.	5.
163	176.	2.	2.	49.	28.	47.	28.	5.
164	177.	2.	2.	50.	28.	44.	26.	5.
165	178.	1.	2.	44.	30.	41.	29.	6.
166	179.	1.	2.	41.	27.	42.	26.	4.
167	180.	1.	2.	22.	13.	18.	11.	3.
168	181.	1.	2.	47.	31.	42.	28.	5.
169	182.	2.	2.	37.	26.	36.	25.	5.
170	183.	1.	2.	50.	29.	45.	27.	5.
171	184.	1.	2.	49.	28.	47.	29.	6.
172	185.	2.	2.	55.	28.	54.	26.	6.
173	186.	1.	2.	46.	30.	41.	27.	6.
174	187.	1.	2.	48.	34.	53.	34.	6.
175	188.	1.	2.	53.	31.	52.	29.	5.
176	189.	1.	2.	33.	25.	36.	26.	3.
177	190.	1.	2.	42.	32.	41.	30.	6.
178	191.	2.	2.	47.	29.	43.	28.	6.
179	192.	1.	2.	37.	29.	35.	30.	5.
180	193.	2.	2.	65.	34.	61.	29.	5.
181	194.	1.	2.	54.	28.	67.	29.	6.
182	195.	1.	2.	58.	28.	56.	28.	6.
183	196.	1.	2.	49.	28.	31.	26.	5.
184	197.	2.	2.	25.	24.	54.	29.	5.
185	198.	2.	2.	46.	24.	29.	23.	6.
186	200.	2.	2.	48.	29.	46.	27.	6.
187	201.	2.	2.	44.	28.	45.	20.	4.
188	202.	2.	2.	42.	25.	33.	24.	4.
189	203.	1.	2.	30.	29.	50.	30.	5.
190	204.	2.	2.	31.	31.	32.	30.	2.
191	205.	2.	2.	54.	30.	39.	29.	5.
192	206.	2.	2.	38.	31.	29.	29.	5.

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FILE NCNAME (CREATION DATE = 81/04/16.)

CASE-NO	ID	SEX	GROUP	PREREAD	PREMATH	POSREAD	POSMATH	AGE
193	207.	2.	2.	56.	33.	60.	33.	6.
194	208.	1.	2.	27.	23.	28.	25.	5.
195	209.	2.	2.	21.	24.	29.	21.	3.
196	210.	1.	2.	41.	23.	41.	26.	3.
197	211.	1.	2.	47.	23.	46.	22.	4.
198	212.	1.	2.	42.	28.	37.	27.	5.
199	214.	2.	2.	53.	20.	52.	29.	6.
200	216.	1.	2.	58.	24.	57.	28.	6.
201	217.	1.	2.	48.	26.	46.	25.	5.
202	218.	2.	2.	33.	26.	40.	25.	4.
203	219.	1.	2.	46.	22.	45.	27.	5.
204	220.	1.	2.	47.	35.	44.	30.	6.
205	221.	1.	2.	32.	23.	24.	24.	3.
206	222.	1.	2.	57.	31.	55.	31.	6.
207	223.	2.	2.	29.	26.	24.	24.	3.
208	224.	1.	2.	46.	35.	52.	33.	6.
209	225.	2.	2.	34.	29.	44.	29.	6.
210	226.	1.	2.	54.	33.	56.	33.	6.
211	227.	2.	2.	55.	30.	56.	29.	6.
212	228.	1.	2.	55.	36.	57.	34.	6.
213	229.	1.	2.	46.	29.	46.	29.	5.
214	230.	1.	3.	43.	26.	32.	21.	4.
215	231.	1.	3.	38.	30.	37.	27.	5.
216	232.	1.	3.	24.	27.	27.	25.	5.
217	233.	2.	3.	43.	29.	36.	23.	5.
218	234.	1.	3.	22.	26.	27.	23.	3.
219	235.	2.	3.	28.	25.	29.	24.	4.
220	236.	1.	3.	19.	24.	27.	28.	4.
221	237.	1.	3.	35.	24.	34.	30.	6.
222	238.	1.	3.	56.	27.	54.	28.	6.
223	239.	1.	3.	41.	26.	35.	23.	6.
224	240.	1.	3.	48.	29.	47.	28.	6.
225	241.	2.	3.	30.	26.	27.	24.	4.
226	242.	1.	3.	31.	29.	35.	28.	5.
227	244.	2.	3.	42.	23.	46.	24.	3.
228	245.	1.	3.	39.	23.	52.	29.	4.
229	246.	1.	3.	44.	23.	45.	23.	6.
230	247.	1.	3.	35.	20.	37.	23.	4.
231	248.	2.	3.	31.	15.	31.	19.	4.
232	249.	1.	3.	31.	29.	20.	19.	4.
233	250.	2.	3.	61.	29.	63.	25.	5.
234	251.	1.	3.	49.	24.	52.	20.	5.
235	252.	2.	3.	56.	31.	49.	22.	5.
236	253.	1.	3.	45.	25.	30.	24.	4.
237	254.	2.	3.	44.	27.	43.	25.	6.
238	255.	2.	3.	47.	24.	50.	25.	5.
239	256.	1.	3.	37.	24.	60.	24.	5.
240	257.	1.	3.	46.	24.	48.	22.	6.

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FILE NONAME (CREATION DATE = 81/04/16.)

CASE-NO	ID	SEX	GROUP	PREREAD	PREMATH	POSREAD	POSMATH	AGE
241	259.	1.	3.	54.	21.	51.	17.	6.
242	260.	2.	3.	45.	31.	47.	25.	4.
243	261.	1.	3.	60.	30.	63.	30.	6.
244	262.	1.	3.	59.	30.	61.	31.	6.
245	263.	2.	3.	36.	36.	32.	27.	4.
246	264.	1.	3.	47.	36.	45.	28.	6.
247	265.	1.	3.	52.	39.	48.	27.	5.
248	266.	2.	3.	51.	38.	46.	26.	5.
249	267.	1.	3.	48.	28.	49.	27.	5.
250	268.	2.	3.	36.	26.	57.	26.	4.
251	269.	1.	3.	34.	27.	37.	29.	5.
252	270.	2.	3.	45.	22.	37.	26.	5.
253	272.	2.	3.	24.	16.	15.	16.	6.
254	274.	2.	3.	52.	20.	51.	20.	5.
255	275.	2.	3.	28.	11.	25.	15.	5.
256	276.	2.	3.	25.	11.	24.	10.	2.
257	277.	2.	3.	32.	26.	31.	26.	5.
258	278.	1.	3.	54.	29.	46.	29.	6.
259	279.	2.	3.	31.	22.	25.	20.	3.
260	280.	2.	3.	37.	27.	44.	28.	5.
261	281.	2.	3.	39.	28.	38.	27.	5.
262	282.	1.	3.	60.	30.	61.	33.	5.
263	285.	1.	3.	26.	24.	25.	25.	4.
264	286.	2.	3.	34.	23.	35.	23.	4.
265	287.	1.	3.	41.	26.	26.	22.	6.
266	288.	2.	2.	66.	33.	65.	33.	5.
267	289.	1.	2.	58.	28.	59.	29.	6.
268	291.	1.	2.	26.	12.	25.	12.	6.
269	292.	2.	2.	32.	24.	30.	20.	4.
270	293.	1.	2.	66.	25.	54.	27.	5.
271	294.	1.	2.	46.	30.	45.	28.	5.
272	295.	1.	2.	42.	27.	44.	24.	3.
273	296.	2.	2.	53.	27.	50.	24.	4.
274	297.	1.	2.	54.	27.	50.	27.	4.
275	299.	2.	2.	36.	25.	34.	26.	6.
276	300.	2.	2.	51.	30.	44.	29.	6.
277	301.	1.	2.	57.	32.	48.	31.	6.
278	302.	1.	1.	56.	32.	50.	31.	6.
279	313.	2.	1.	64.	30.	67.	30.	5.
280	314.	2.	1.	43.	32.	45.	34.	4.
281	315.	1.	1.	35.	26.	64.	28.	6.
282	316.	1.	1.	57.	31.	56.	30.	4.
283	317.	2.	1.	63.	32.	71.	33.	4.
284	318.	1.	1.	64.	34.	67.	28.	4.
285	319.	2.	1.	65.	33.	59.	33.	4.
286	320.	2.	1.	33.	40.	32.	41.	5.
287	321.	1.	1.	48.	40.	40.	36.	6.
288	322.	1.	1.	63.	34.	69.	34.	6.

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FILE NONAME (CREATION DATE = 81/04/16.)

CASE-NO	ID	SEX	GNOLP	PREREAD	PREMATH	POSTREAD	POSTMATH	AGE
289	323.	1.	1.	70.	38.	73.	34.	6.
290	324.	1.	1.	98.	48.	92.	51.	6.
291	326.	1.	1.	53.	31.	55.	28.	4.
292	327.	2.	1.	55.	29.	58.	30.	4.
293	328.	1.	1.	62.	31.	57.	29.	5.
294	329.	1.	1.	53.	25.	62.	25.	3.

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APPENDIX E

CROSS TABULATIONS OF

SEX BY GROUP

AND

AGE BY GROUP

SUMMER VACATION RETENTION 81/04/20. 17.56.12. PAGE 3

FILE NONAME (CREATION DATE = 81/04/20.)

* CROSSTABULATION OF *
AGE BY GROUP
* PAGE 1 OF 1

AGE	COUNT / ROW PCT / COL PCT / TOT PCT	GROUP 1.1 REG ED	2.1 RES SP	3.1 SP CLASS	ROW TOTAL
6 YR OLDS	1.	1	0	0	1
		100.0	0	0	.3
		.8	0	0	
		.3	0	0	
7 YR OLDS	2.	1	2	1	4
		25.0	50.0	25.0	1.4
		.8	1.9	1.7	
		.3	.7	.3	
8 YR OLDS	3.	10	9	3	22
		45.5	40.9	13.6	7.5
		7.8	8.3	5.2	
		3.4	3.1	1.0	
9 YR OLDS	4.	39	18	16	73
		53.4	24.7	21.9	24.8
		30.5	16.7	27.6	
		13.3	6.1	5.4	
10 YR OLDS	5.	32	34	21	87
		36.8	39.1	24.1	29.6
		25.0	31.5	36.2	
		10.9	11.6	7.1	
11 YR OLDS	6.	45	45	17	107
		42.1	42.1	15.9	36.4
		35.2	41.7	29.3	
		15.3	15.3	5.8	
	COLUMN TOTAL	128	108	58	294
		43.5	36.7	19.7	100.0

RAW CHI SQUARE = 10.69095 WITH 10 DEGREES OF FREEDOM. SIGNIFICANCE = .3821

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SUMMER VACATION RETENTION 81/04/20. 17.56.12. PAGE 2

FILE NONAME (CREATION DATE = 81/04/20.)

* CROSSTABULATION OF *
SEX BY GROUP
* PAGE 1 OF 1

SEX	COUNT / ROW PCT / COL PCT / TOT PCT	GROUP 1.REG ED	2.RES SP	3.SP CLASS	ROW TOTAL
1. MALE	COUNT	62	72	29	163
	ROW PCT	38.0	44.2	17.8	55.6
	COL PCT	48.8	66.7	50.0	
	TOT PCT	21.2	24.6	9.9	
2. FEMALE	COUNT	65	36	29	130
	ROW PCT	50.0	27.7	22.3	44.4
	COL PCT	51.2	33.3	50.0	
	TOT PCT	22.2	12.3	9.9	
COLUMN TOTAL		127	108	58	293
		43.3	36.9	19.8	100.0

RAW CHI SQUARE = 8.46148 WITH 2 DEGREES OF FREEDOM. SIGNIFICANCE = .0145

NUMBER OF MISSING OBSERVATIONS = 1

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```
STATE UNIVERSITY DATA CENTER
THE CALIFORNIA STATE UNIVERSITY AND COLLEGES

S P S S - - STATISTICAL PACKAGE FOR THE SOCIAL SCIENCES

VERSION 8.0 -- JAN 31, 1981



127700 CM MAXIMUM FIELD LENGTH


                PAGESIZE        55
                RUN NAME        SUMMER VACATION RETENTION
                VARIABLE LIST   ID,MONTH,DAY,YR,SEX,GROUP,PREREAD,PREMATH,POSREAD,POSMATH
                INPUT FORMAT    FIXED(F3.0,3F2.0,2F1.0,1X,2F2.0/12X,2F2.0)

               ACCORDING TO YOUR INPUT FORMAT, VARIABLES ARE TO BE READ AS FOLLOWS

               VARIABLE  FORMAT  RECORD    COLUMNS

               ID        F 3. 0        1     1-   3
               MONTH     F 2. 0        1     4-   5
               DAY       F 2. 0        1     6-   7
               YR        F 2. 0        1     8-   9
               SEX       F 1. 0        1    10-  10
               GROUP     F 1. 0        1    11-  11
               PREREAD   F 2. 0        1    13-  14
               PREMATH   F 2. 0        1    15-  16
               POSREAD   F 2. 0        2    13-  14
               POSMATH   F 2. 0        2    15-  16

THE INPUT FORMAT PROVIDES FOR  10 VARIABLES.   10 WILL BE READ.
IT PROVIDES FOR  2 RECORDS (*CARDS*) PER CASE.
A MAXIMUM OF    16 *COLUMNS* ARE USED ON A RECORD.

                COMPUTE         AGE=80-YR
                N OF CASES      294
                IF              (AGE GT 12 OR AGE LT 6) AGE=0
                RECODE          AGE (6=1),(7=2),(8=3),(9=4),(10=5),(11,12=6)
                VALUE LABLES    AGE (1) 6 YR OLDS (2) 7 YR OLDS (3) 8 YR OLDS
                                (4) 9 YR OLDS (5) 10 YR OLDS (6) 11 YR OLDS/
                                SEX (1) MALE (2) FEMALE/
                                GROUP(1) REG ED (2) RES SP (3) SP CLASS
                MISSING VALUES  ID TO AGE (0)
                CROSSTABS       TABLES=SEX, AGE BY GROUP/
                STATISTICS      1
                READ INPUT DATA

          GIVEN 2 DIMENSIONS,  INITIAL CM ALLOWS FOR     651 CELLS
                               MAXIMUM CM ALLOWS FOR    5285 CELLS
```


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APPENDIX F

DESCRIPTIVE STATISTICS

OF SUB POPULATIONS

FILE NONAME (CREATION DATE = 81/04/20.)

- - - - - - - - - - - - - - - - DESCRIPTION OF SUBPOPULATIONS - - - - - - - - - - - - - - - -

CRITERION VARIABLE POSMATH
BROKEN DOWN BY GROUP

VARIABLE	CODE	VALUE LABEL	SUM	MEAN	STD DEV	VARIANCE		N
FOR ENTIRE POPULATION			8506.0000	28.9320	5.7563	33.1353	(	2943
GROUP	1.	REG ED	4142.0000	32.3594	5.2312	27.3659	(	1281
GROUP	2.	RES SP	2948.0000	27.2963	4.6267	21.4067	(	1081
GROUP	3.	SP CLASS	1416.0000	24.4138	4.1169	16.9486	(	581

TOTAL CASES = 294

FILE NONAME (CREATION DATE = 81/04/20.)

- - - - - - - - - - - - - - - - DESCRIPTION OF SUBPOPULATIONS - - - - - - - - - - - - - - - -

CRITERION VARIABLE AGE
BROKEN DOWN BY GROUP

VARIABLE	CODE	VALUE LABEL	SUM	MEAN	STD DEV	VARIANCE		N
FOR ENTIRE POPULATION			1444.0000	4.9116	1.0413	1.0843	(	2943
GROUP	1.	REG ED	619.0000	4.8359	1.0706	1.1461	(	1281
GROUP	2.	RES SP	543.0000	5.0278	1.0453	1.0927	(	1081
GROUP	3.	SP CLASS	282.0000	4.8621	.9633	.9280	(	581

TOTAL CASES = 294

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FILE NONAME (CREATION DATE = 81/04/20.)

- - - - - - - - - - - - - - - - DESCRIPTION OF SUBPOPULATIONS - - - - - - - - - - - - - - - -

CRITERION VARIABLE POSREAD
BROKEN DOWN BY GROUP

VARIABLE	CODE	VALUE LABEL	SUM	MEAN	STD DEV	VARIANCE	N
FOR ENTIRE POPULATION			16391.0000	55.7517	16.7706	281.2521	(294)
GROUP	1.	REG ED	8857.0000	69.1953	11.5868	134.2829	(128)
GROUP	2.	RES SP	5164.0000	47.8148	11.7156	137.2591	(108)
GROUP	3.	SP CLASS	2370.0000	40.8621	11.7540	138.1561	(58)

TOTAL CASES = 294

FILE NONAME (CREATION DATE = 81/04/20.)

- - - - - - - - - - - - - - - - DESCRIPTION OF SUBPOPULATIONS - - - - - - - - - - - - - - - -

CRITERION VARIABLE PREMATH
BROKEN DOWN BY GROUP

VARIABLE	CODE	VALUE LABEL	SUM	MEAN	STD DEV	VARIANCE	N
FOR ENTIRE POPULATION			8805.0000	29.9490	5.9285	35.1476	(294)
GROUP	1.	REG ED	4254.0000	33.2344	5.5137	30.4013	(128)
GROUP	2.	RES SP	3020.0000	27.9630	4.5875	21.0453	(108)
GROUP	3.	SP CLASS	1531.0000	26.3966	5.3736	28.8751	(58)

TOTAL CASES = 294

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CPU TIME REQUIRED.. .2270 SECONDS

BREAKDOWN TABLES=SEX, PREREAD TO AGE BY GROUP/

GIVEN 1 DIMENSIONS, INITIAL CM ALLOWS FOR 2578 CELLS
MAXIMUM CM ALLOWS FOR 4828 CELLS

FILE NONAME (CREATION DATE = 81/04/20.)

---------- DESCRIPTION OF SUBPOPULATIONS ----------

CRITERION VARIABLE SEX
BROKEN DOWN BY GROUP

VARIABLE	CODE	VALUE LABEL	SUM	MEAN	STD DEV	VARIANCE	N
FOR ENTIRE POPULATION			423.0000	1.4437	.4977	.2477	(293)
GROUP	1.	REG ED	192.0000	1.5118	.5019	.2518	(127)
GROUP	2.	RES SP	144.0000	1.3333	.4736	.2243	(108)
GROUP	3.	SP CLASS	87.0000	1.5000	.5044	.2544	(58)

TOTAL CASES = 294
MISSING CASES = 1 OR .3 PCT.

FILE NONAME (CREATION DATE = 81/04/20.)

---------- DESCRIPTION OF SUBPOPULATIONS ----------

CRITERION VARIABLE PREREAD
BROKEN DOWN BY GROUP

VARIABLE	CODE	VALUE LABEL	SUM	MEAN	STD DEV	VARIANCE	N
FOR ENTIRE POPULATION			16265.0000	55.3231	15.3927	236.9362	(294)
GROUP	1.	REG ED	8569.0000	66.9453	11.3334	128.4458	(128)
GROUP	2.	RES SP	5251.0000	48.6204	11.4302	130.6489	(108)
GROUP	3.	SP CLASS	2445.0000	42.1552	11.0276	121.6071	(58)

TOTAL CASES = 294

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APPENDIX G

DESCRIPTIVE STATISTICS

OF TOTAL SAMPLE POPULATION

FILE - NONAME (CREATED - 81/04/16)

AGE

CATEGORY LABEL	CODE	ABSOLUTE FREQ	RELATIVE FREQ (PCT)	ADJUSTED FREQ (PCT)	CUM FREQ (PCT)
6 YR OLDS	1.	1	.3	.3	.3
7 YR OLDS	2.	4	1.4	1.4	1.7
8 YR OLDS	3.	22	7.5	7.5	9.2
9 YR OLDS	4.	73	24.8	24.8	34.0
10 YR OLDS	5.	87	29.6	29.6	63.6
11 YR OLDS	6.	107	36.4	36.4	100.0
	TOTAL	294	100.0	100.0	

MEAN	4.912	STD ERR	.061	MEDIAN	5.040
MODE	6.000	STD DEV	1.041	VARIANCE	1.084
KURTOSIS	-.021	SKEWNESS	-.699	RANGE	5.000
MINIMUM	1.000	MAXIMUM	6.000	SUM	1444.000
C.V. PCT	21.201	.95 C.I.	4.792	TO	5.031

VALID CASES 294 MISSING CASES 0

CPU TIME REQUIRED.. .4880 SECONDS

BREAKDOWN VARIABLES=SEX, PREREAD TO AGE, GROUP(1,3)/
TABLES=SEX, PREREAD TO AGE BY GROUP/

00046400 CM NEEDED FOR BREAKDOWN

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SUMMER VACATION RETENTION 81/04/16. 12.33.11. PAGE 8

FILE - NONAME (CREATED - 81/04/16)

POSMATH

CODE	FREQ	PCT	ADJ PCT	CUM PCT	CODE	FREQ	PCT	ADJ PCT	CUM PCT	CODE	FREQ	PCT	ADJ PCT	CUM PCT
10.	1	0	0		24.	16	5	5	17	36.	6	2	2	92
11.	1	0	0	1	25.	13	4	4	21	37.	1	0	0	93
12.	1	0	0	1	26.	18	6	6	28	38.	4	1	1	94
15.	1	0	0	1	27.	23	8	8	35	39.	5	2	2	96
16.	1	0	0	2	28.	33	11	11	47	40.	2	1	1	96
17.	5	2	2	3	29.	36	12	12	59	41.	5	2	2	98
18.	1	0	0	4	30.	34	12	12	70	42.	1	0	0	98
19.	3	1	1	5	31.	15	5	5	76	44.	1	0	0	99
20.	5	2	2	6	32.	13	4	4	80	45.	1	0	0	99
21.	2	1	1	7	33.	14	5	5	85	48.	1	0	0	99
22.	5	2	2	9	34.	15	5	5	90	51.	1	0	0	100
23.	8	3	3	12	35.	1	0	0	90	57.	1	0	0	100

MEAN	28.932	STD ERR	.336
MODE	29.000	STD DEV	5.756
KURTOSIS	3.275	SKEWNESS	.527
MINIMUM	10.000	MAXIMUM	57.000
C.V. PCT	19.896	.95 C.I.	28.271
			TO 29.593
VALID CASES	294	MISSING CASES	0

MEDIAN	28.779
VARIANCE	33.135
RANGE	47.000
SUM	8506.000

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SUMMER VACATION RETENTION 81/09/16. 12.31.41. PAGE 7

FILE - NONAME (CREATED - 81/09/16)

PDSREAD

CODE	FREQ	ADJ PCT	CUM PCT	CODE	FREQ	ADJ PCT	CUM PCT	CODE	FREQ	ADJ PCT	CUM PCT
15.	1	0	0	45.	8	3	27	69.	4	1	78
18.	1	0	1	46.	6	2	29	70.	3	1	79
20.	1	0	1	47.	6	2	31	71.	6	2	81
24.	1	0	1	48.	8	3	33	72.	5	2	83
25.	6	2	3	49.	6	2	35	73.	3	1	84
26.	1	0	4	50.	3	1	36	74.	2	1	85
27.	3	1	5	51.	5	2	38	75.	6	2	87
28.	5	2	6	52.	9	3	41	76.	4	1	88
29.	4	1	8	53.	9	3	44	77.	3	1	89
30.	2	1	9	54.	8	3	47	78.	2	1	90
31.	3	1	10	55.	8	3	50	79.	3	1	91
32.	3	1	11	56.	16	5	55	80.	3	1	92
33.	1	0	11	57.	9	3	58	81.	2	1	93
34.	3	1	12	58.	5	2	60	82.	2	1	93
35.	5	2	14	59.	6	2	62	83.	2	1	94
36.	3	1	15	60.	8	3	65	84.	3	1	95
37.	5	2	16	61.	5	2	66	85.	3	1	96
38.	1	0	17	62.	3	1	67	88.	3	1	97
39.	2	1	17	63.	3	1	68	89.	4	1	98
40.	2	1	18	64.	5	2	70	90.	1	0	99
41.	4	1	19	65.	3	1	71	91.	1	0	99
42.	2	1	20	66.	3	1	72	92.	2	1	100
43.	4	1	21	67.	9	3	75	97.	1	0	100
44.	7	2	24	68.	5	2	77				

MEAN	55.792	STD ERR	.979	MEDIAN	55.563
MODE	56.000	STD DEV	16.771	VARIANCE	281.252
KURTOSIS	-.462	SKEWNESS	.053	RANGE	82.000
MINIMUM	15.000	MAXIMUM	97.000	SUM	16391.000
C.V. PCT	30.081	.95 C.I.	53.827	TO	57.677

VALID CASES 294 MISSING CASES 0

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SUMMER VACATION PROVISION 81/04/16. 17.33.11. PAGE

FILE = WORKMO (CREATED: 81/04/16)

REMAIN

CODE	FREQ	ADJ PCT	CUM PCT	CODE	FREQ	ADJ PCT	CUM PCT	CODE	FREQ	ADJ PCT	CUM PCT
11.	2	1	1	25.	10	3	17	37.	4	1	89
12.	1	0	1	26.	18	6	23	38.	9	3	92
13.	1	0	1	27.	14	5	28	39.	7	2	94
15.	1	0	2	28.	34	12	39	40.	3	1	95
16.	1	0	2	29.	32	11	50	41.	6	2	97
17.	1	0	2	30.	31	11	61	42.	2	1	98
19.	2	1	3	31.	29	10	70	43.	1	0	98
20.	5	2	5	32.	13	4	74	44.	1	0	99
21.	2	1	5	33.	10	3	78	46.	1	0	99
22.	4	1	7	34.	13	4	82	48.	1	0	99
23.	10	3	10	35.	7	2	85	50.	1	0	100
24.	9	3	13	36.	8	3	87	57.	1	0	100

MEAN	29.949	STD ERR	.346	MEDIAN	29.500
MODE	28.000	STD DEV	5.929	VARIANCE	35.148
KURTOSIS	2.405	SKEWNESS	.348	RANGE	46.000
MINIMUM	11.000	MAXIMUM	57.000	SUM	8805.000
C.V. PCT	19.795	.95 C.I.	29.268 TO		30.629

VALID CASES 294 MISSING CASES 0

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FILE = NONAME (CREATED = 91/04/15)

PARAGRAPH

CODE	FREQ	ADJ PCT	CUM PCT	CODE	FREQ	ADJ PCT	CUM PCT	CODE	FREQ	ADJ PCT	CUM PCT
19.	1	0	0	44.	4	1	23	68.	6	2	80
21.	1	0	1	45.	3	1	24	69.	3	1	81
22.	2	1	1	46.	6	2	27	70.	6	2	83
23.	1	0	2	47.	7	2	29	71.	8	3	86
24.	2	1	2	48.	9	3	32	72.	3	1	87
25.	1	0	3	49.	6	2	34	73.	5	2	89
26.	2	1	3	50.	5	2	36	74.	2	1	89
27.	3	1	4	51.	9	3	39	75.	3	1	90
28.	2	1	5	52.	3	1	40	76.	2	1	91
29.	1	0	5	53.	7	2	42	77.	2	1	92
30.	1	0	6	54.	13	4	47	78.	4	1	93
31.	5	2	7	55.	8	3	49	79.	1	0	94
32.	3	1	9	56.	15	5	54	81.	3	1	95
33.	2	1	9	57.	9	3	57	82.	2	1	95
34.	4	1	11	58.	11	4	61	83.	1	0	96
35.	3	1	12	59.	10	3	65	84.	2	1	96
36.	3	1	13	60.	2	1	65	85.	3	1	97
37.	3	1	14	61.	4	1	67	86.	2	1	99
38.	4	1	15	62.	3	1	68	87.	1	0	98
39.	3	1	16	63.	11	4	71	88.	1	0	99
40.	1	0	16	64.	3	1	72	89.	1	0	99
41.	6	2	18	65.	6	2	74	92.	1	0	99
42.	8	3	21	66.	7	2	77	93.	1	0	100
43.	1	1	22	67.	4	1	78	96.	1	0	100

MEAN	55.323	STD ERR	.898	MEDIAN	55.633
MODE	56.000	STD DEV	15.393	VARIANCE	236.936
KURTOSIS	-.252	SKEWNESS	.022	RANGE	77.000
MINIMUM	19.000	MAXIMUM	96.000	SUM	16265.000
C.V. PCT	27.823	.95 C.I.	53.556	TO	57.090

VALID CASES 294 MISSING CASES 0

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FILE - NONAME (CREATED - 81/04/16)

GROUP

CATEGORY LABEL	CODE	ABSOLUTE FREQ	RELATIVE FREQ (PCT)	ADJUSTED FREQ (PCT)	CUM FREQ (PCT)
4PG ED	1.	180	43.9	43.9	43.9
4P3 SP	2.	108	36.7	36.7	80.3
SP CLASS	3.	58	19.7	19.7	100.0
	TOTAL	294	100.0	100.0	

MEAN	1.762	STD ERR	.044	MEDIAN	1.676
MODE	1.000	STD DEV	.760	VARIANCE	.578
KURTOSIS	-1.156	SKEWNESS	.430	RANGE	2.000
MINIMUM	1.000	MAXIMUM	3.000	SUM	518.000
C.V. PCT	43.147	.95 C.I.	1.675	TO	1.849

VALID CASES 294 MISSING CASES 0

FILE - NONAME (CREATED - 81/04/16)

SEX

CATEGORY LABEL	CODE	ABSOLUTE FREQ	RELATIVE FREQ (PCT)	ADJUSTED FREQ (PCT)	CUM FREQ (PCT)
MALE	1.	163	55.4	55.6	55.6
FEMALE	2.	130	44.2	44.4	100.0
	BLANK	1	.3	MISSING	
	TOTAL	294	100.0	100.0	

MEAN	1.444	STD ERR	.029	MEDIAN	1.399
MODE	1.000	STD DEV	.498	VARIANCE	.248
KURTOSIS	-1.962	SKEWNESS	.228	RANGE	1.000
MINIMUM	1.000	MAXIMUM	2.000	SUM	423.000
C.V. PCT	34.472	.95 C.I.	1.386	TO	1.501

VALID CASES 293 MISSING CASES 1

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APPENDIX H

ANOVA - REGULAR EDUCATION PUPILS

VERSUS

RESOURCE SPECIALIST PUPILS

CPU TIME REQUIRED.. .1240 SECONDS

```
*SELECT IF    ( GROUP EQ 1 OR GROUP EQ 2)
ANOVA         POSTREAD BY GROUP(1,3) WITH PREREAD, AGE/
STATISTICS    ALL
```

0C046500 CM NEEDED FOR ANOVA

FILE NONAME (CREATION DATE = 81/04/16.)

* * * * * * * * * * * * * CELL MEANS * * * * * * * * * * * *

POSTREAD
BY GROUP

* *

TOTAL POPULATION

59.41
(238)

GROUP

1	2	3
69.20	47.81	0
(128)	(108)	(0)

FILE NONAME (CREATION DATE = 81/04/16.)

* * * * * * * * * ANALYSIS OF VARIANCE * * * * * * * * *

POSTREAD
BY GROUP
WITH PREREAD
AGE

* *

SOURCE OF VARIATION	SUM OF SQUARES	DF	MEAN SQUARE	F	SIGNIF OF F
COVARIATES	23565.993	2	26792.782	1445.040	.001
PREREAD	49156.254	1	49158.254	2651.297	.001
AGE	.855	1	.855	.046	.830
MAIN EFFECTS	626.008	1	626.008	33.763	.001
GROUP	626.008	1	626.008	33.763	.001
EXPLAINED	54211.571	3	18070.524	974.614	.001
RESIDUAL	4301.560	232	18.541		
TOTAL	58513.131	235	249.092		

COVARIATE	REGRESSION COEFFICIENT ADJUSTED ALL OTHER COVARIATES
PREREAD	1.037
AGE	-.059

236 CASES WERE PROCESSED.
0 CASES (0 PCT) WERE MISSING.

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SUMMER VACATION RETENTION

FILE NONAME (CREATION DATE = 81/04/16.)

** MULTIPLE CLASSIFICATION ANALYSIS **

POSREAD
BY GROUP
WITH PREREAD
AGE

GRAND MEAN = 59.41

VARIABLE + CATEGORY	N	UNADJUSTED DEV'N	ETA	ADJUSTED FOR INDEPENDENTS DEV'N	BETA	ADJUSTED FOR INDEPENDENTS + COVARIATES DEV'N	BETA
GROUP						2.07	
1 REG ED	129	3.78				-2.45	
2 RES SP	109	-11.60	.66				.19
MULTIPLE R SQUARED							.926
MULTIPLE R							.963

SUMMER VACATION RETENTION

CPU TIME REQUIRED.. .0970 SECONDS

```
*SELECT IF      (GROUP EQ 1 OR GROUP EQ 2)
ANOVA           POSMATH BY GROUP(1,3) WITH PREMATH,AGE/
STATISTICS      ALL

00246500 CM NEEDED FOR ANOVA
```


SUMMER VACATION RETENTION

FILE NONAME (CREATION DATE = 81/04/16.)

** CELL MEANS **

POSMATH
BY GROUP

TOTAL POPULATION

30.04
(236)

GROUP

1	2	3
32.16	27.30	0
(128)	(108)	(0)

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FILE NONAME (CREATION DATE = 81/04/16.)

** MULTIPLE CLASSIFICATION ANALYSIS **

BY POSMATH
WITH GROUP
PREMATH
AGE

GRAND MEAN = 30.04

VARIABLE + CATEGORY	N	UNADJUSTED DEV'N	UNADJUSTED ETA	ADJUSTED FOR INDEPENDENTS DEV'N	ADJUSTED FOR INDEPENDENTS ETA	ADJUSTED FOR INDEPENDENTS + COVARIATES DEV'N	ADJUSTED FOR INDEPENDENTS + COVARIATES BETA
GROUP							
1 REG ED	129	2.32				.57	
2 RES SP	108	-2.75				-.67	
			.45				.11
MULTIPLE R SQUARED							.754
MULTIPLE R							.868

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FILE NONAME (CREATION DATE = 81/04/16.1

* * * * * * * * A N A L Y S I S O F V A R I A N C E * * * * * * * *

POSMATH
BY GROUP
WITH PREMATH
AGE

* *

SOURCE OF VARIATION	SUM OF SQUARES	DF	MEAN SQUARE	F	SIGNIF OF F
COVARIATES	5413.827	2	2706.913	350.620	.001
PREMATH	4208.520	1	4208.520	545.119	.001
AGE	24.550	1	24.550	3.180	.076
MAIN EFFECTS	62.624	1	62.624	8.112	.005
GROUP	62.624	1	62.624	8.112	.005
EXPLAINED	5476.451	3	1825.484	236.450	.001
RESIDUAL	1791.125	232	7.720		
TOTAL	7267.576	235	30.926		

COVARIATE	REGRESSION COEFFICIENT ADJUSTED FOR ALL OTHER COVARIATES
PREMATH	.833
AGE	.334

236 CASES WERE PROCESSED.
0 CASES (0 PCT) WERE MISSING.

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APPENDIX I

ANOVA - REGULAR EDUCATION PUPILS

VERSUS

SPECIAL CLASS PUPILS

SUMMER VACATION RETENTION 81/04/16. 13.23.39. PAGE 9

CPU TIME REQUIRED.. .0720 SECONDS

```
*SELECT IF      (GROUP EQ 1 OR GROUP EQ 3)
ANOVA           POSREAD BY GROUP(1,3) WITH PREREAD,AGE/
STATISTICS      ALL
```

00046500 CM NEEDED FOR ANOVA

SUMMER VACATION RETENTION 81/04/16. 13.23.39. PAGE 10

FILE NONAME (CREATION DATE = 81/04/16.)

* * * * * * * * * * * * CELL MEANS * * * * * * * * * * * *

POSREAD
BY GROUP

* *

TOTAL POPULATION

60.36
(186)

GROUP

1	2	3
69.20	0	40.86
(126)	(0)	(59)

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FILE NONAME (CREATION DATE = 81/04/16.)

* * * * * * * * ANALYSIS OF VARIANCE * * * * * * * *

POSREAD
BY GROUP
WITH PREREAD
AGE

* *

SOURCE OF VARIATION	SUM OF SQUARES	DF	MEAN SQUARE	F	SIGNIF OF F
COVARIATES	52378.115	2	26189.158	1151.712	.001
PREREAD	49214.390	1	49214.390	2164.284	.001
AGE	19.483	1	19.483	.857	.356
MAIN EFFECTS	449.991	1	449.991	19.789	.001
GROUP	449.991	1	449.991	19.789	.001
EXPLAINED	52828.306	3	17609.435	774.404	.001
RESIDUAL	4138.559	182	22.739		
TOTAL	56966.866	185	307.929		

COVARIATE	REGRESSION COEFFICIENT ADJ ALL OTHER COVARIATES
PREREAD	1.052
AGE	-.325

185 CASES WERE PROCESSED.
0 CASES (0 PCT) WERE MISSING.

FILE NONAME (CREATION DATE = 81/04/16.)

* * MULTIPLE CLASSIFICATION ANALYSIS * *

POSMATH
BY GROUP
WITH PREMATH
AGE

* *

GRAND MEAN = 29.88

VARIABLE + CATEGORY	N	UNADJUSTED DEV'N	UNADJUSTED ETA	ADJUSTED FOR INDEPENDENTS DEV'N	ADJUSTED FOR INDEPENDENTS BETA	ADJUSTED FOR INDEPENDENTS + COVARIATES DEV'N	ADJUSTED FOR INDEPENDENTS + COVARIATES BETA
GROUP							
1 REG ED	128	2.48				.99	
3 SP CLASS	58	-5.47				-2.18	
			.60				.24
MULTIPLE R SQUARED							.825
MULTIPLE R							.908

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FILE NONAME (CREATION DATE = 81/04/16.)

* * * * * * * * A N A L Y S I S O F V A R I A N C E * * * * * * * *

POSMATH
BY GROUP
WITH PREMATH
AGE

* *

SOURCE OF VARIATION	SUM OF SQUARES	DF	MEAN SQUARE	F	SIGNIF OF F
COVARIATES	5461.687	2	2730.843	407.551	.001
PREMATH	4456.920	1	4456.920	665.151	.001
AGE	18.172	1	18.172	2.712	.101
MAIN EFFECTS	280.200	1	280.200	41.817	.001
GROUP	280.200	1	280.200	41.817	.001
EXPLAINED	5741.887	3	1913.962	285.640	.001
RESIDUAL	1219.511	182	6.701		
TOTAL	6961.398	185	37.629		

COVARIATE	REGRESSION COEFFICIENT ADJUSTED FOR ALL OTHER COVARIATES
PREMATH	.839
AGE	.327

186 CASES WERE PROCESSED.
0 CASES (0 PCT) WERE MISSING.

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APPENDIX J

PEARSON CORRELATION

CPU TIME REQUIRED.. .0860 SECONDS

PEARSON CORR SEX TO AGE/

00043200 CM NEEDED FOR PEARSON CORR

FILE NONAME (CREATION DATE = 81/04/16.)

PEARSON CORRELATION COEFFICIENTS

	SEX	GROUP	PREREAD	PREMATH	POSREAD	POSMATH	AGE
SEX	1.0000	-.0498	.0550	.0099	.0480	-.0480	-.1918
	(0)	(293)	(293)	(293)	(293)	(293)	(293)
	P=******	P= .203	P= .174	P= .433	P= .207	P= .206	P= .001
GROUP	-.0488	1.0000	-.6566	-.4745	-.6918	-.5465	.0294
	(293)	(0)	(294)	(294)	(294)	(294)	(294)
	P= .203	P=******	P= .001	P= .001	P= .001	P= .001	P= .308
PREREAD	.0550	-.6566	1.0000	.6882	.9592	.7143	.2990
	(293)	(294)	(0)	(294)	(294)	(294)	(294)
	P= .174	P= .001	P=******	P= .001	P= .001	P= .001	P= .001
PREMATH	.0099	-.4745	.6882	1.0000	.6755	.8543	.3763
	(293)	(294)	(294)	(0)	(294)	(294)	(294)
	P= .433	P= .001	P= .001	P=******	P= .001	P= .001	P= .001
POSREAD	.0480	-.6918	.9592	.6755	1.0000	.7238	.2661
	(293)	(294)	(294)	(294)	(0)	(294)	(294)
	P= .207	P= .001	P= .001	P= .001	P=******	P= .001	P= .001
POSMATH	-.0480	-.5465	.7143	.8543	.7238	1.0000	.3788
	(293)	(294)	(294)	(294)	(294)	(0)	(294)
	P= .206	P= .001	P= .001	P= .001	P= .001	P=******	P= .001
AGE	-.1918	.0294	.2990	.3763	.2661	.3788	1.0000
	(293)	(294)	(294)	(294)	(294)	(294)	(0)
	P= .001	P= .308	P= .001	P= .001	P= .001	P= .001	P=******

(COEFFICIENT / CASES / SIGNFICANCE) (99.0000 MEANS UNCOMPUTABLE)

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APPENDIX K

WIDE RANGE ACHIEVEMENT TEST - READING PROTOCOL

APPENDIX K

WIDE RANGE ACHIEVEMENT TEST
READING PROTOCOL

WIDE RANGE ACHIEVEMENT TEST

JASTAK

Page 4
Reading, Level I

	A	R	Z	H	I	Q	S	E	B	O
Two letters in name	A	B	O	S	E	R	T	H	P	I	U	Z	Q

cat see red to big work book eat was him how

then open letter jar deep even spell awake block size

weather should lip finger tray felt stalk cliff lame struck

approve plot huge quality sour imply humidity urge

bulk exhaust abuse collapse glutton clarify

recession threshold horizon residence participate quarantine

luxurious rescinded emphasis aeronautic intrigue repugnant

putative endeavor heresy discretionary persevere anomaly

rudimentary miscreant usurp novice audacious mitosis

seismograph spurious idiosyncrasy itinerary pseudonym aborigines

Level I
Raw Scores (RS)
and Grade Ratings (GR)

SEE MANUAL FOR NORMS

RS	GR	RS	GR	RS	GR	RS	GR	RS	GR	RS	GR	RS	GR	RS	GR	RS	GR
0	N7	9	P6	18	K6	[illegible]	1.5	36	2.3	45	2.8	54	3.6	63	5		
1	N8	10	P7	19	K7	26	1.6	37	2.4	46	2.9	55	3.9	64	6		
2	N9	11	P8	20	K8	29	1.7	38	2.5	47	2.9	56	4.0	65	7		
3	P0	12	P9	21	K9	30	1.8	39	2.7	48	3.0	57	4.1	66	8		
4	P1	13	K0	22	1.0	31	1.9	40	2.8	49	3.1	58	4.2	67	9		
5	P2	14	K1	23	1.1	32	2.0	41	2.8	50	3.2	59	4.4	68	6.0		
6	P3	15	K2	24	1.2	33	2.1	42	2.8	51	3.3	60	4.5	69	6.1		
7	P4	16	K4	25	1.3	34	2.2	43	2.	52	3.4	61	4.7	70	6.4		
8	P5	17	K5	26	1.4	35	2.2	44	[illegible]	53	3.6	62	4.9	71	6.5		

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APPENDIX L

WIDE RANGE ACHIEVEMENT TEST -

ARITHMETIC PROTOCOL

APPENDIX L

WIDE RANGE ACHIEVEMENT TEST
ARITHMETIC PROTOCOL

WIDE RANGE ACHIEVEMENT TEST

JASTAK

Page 2, Arithmetic, Level I
Oral Part

● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ●

17 11 9 5 3

3 Fingers. 8 fingers. 9 or 6? 42 or 28?

3 pennies, spend 1?_____. 3 + 4 apples?_____; 9 marbles, lose 3?_____

Written Part

1 + 1 = _____

6 + 2 = 5 - 3 = 32 + 40 = 24

4 x 2 = _____ 23 x 3 = 29 - 18 = 75 + 8

4 — 1 = _____

452 + 137 + 245 = _____

6 ÷ 2 = _____

$62.04 - 5.30 = _____

$1\frac{1}{2}$ hr. = _____ min.

$\frac{1}{3} + \frac{1}{3}$ = _____

6)968

$\frac{15}{5}$ = _____

$\frac{7}{9} - \frac{5}{9}$ = _____

823 x 96 = _____

$4\frac{5}{6} + 3\frac{1}{3} + 2\frac{1}{2}$ = _____

$\frac{2}{5}$ of 35 = _____

$\frac{1}{2}$ yd. = _____ in.

$1\frac{3}{4} = \frac{}{4}$

27)384

$\frac{2}{3} = \frac{}{12}$

5 - $1\frac{1}{3}$ = _____

$\frac{3}{4}$ yr. = _____ mo.

$2\frac{1}{3}$ doz. = _____

Multiply 7.96 x 30.8 = _____

Which is more?
$\frac{7}{8}$ or $\frac{13}{15}$

Ans. _____

Find the average of
24, 18, 21, 26, 17

Ans. _____

Write as a percent
$\frac{3}{4}$ = _____ %

$4\frac{1}{5} \times 3\frac{1}{3}$ = _____

Raw Scores (RS) and Grade Ratings (GR)

SEE MANUAL FOR NORMS

RS	GR	RS	GR	RS	GR	RS	GR	RS	GR	RS	GR	RS	GR	RS	GR	RS	GR	RS	GR	RS	GR	RS	GR
0	N1	5	N8	10	P8	15	K9	20	21	25	29	30	39	35	49	40	60	46	75	52	[illegible]	58	[illegible]
1	N2	6	P0	11	P9	16	11	21	23	26	31	31	41	36	51	41	63	47	76	53	94	59	108
2	N4	7	P2	12	K2	17	14	22	25	27	33	32	43	37	53	42	66	48	80	54	98	60	112
3	N6	8	P4	13	K4	18	17	23	26	28	35	33	45	38	55	43	69	49	83	55	98	61	115
4	N7	9	P6	14	K7	19	19	24	27	29	37	34	47	39	58	44	71	50	86	56	100	62	[illegible]
																45	73	51	89	57	102	[illegible]	[illegible]

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